THE

# AMERICAN JOURNAL

# OF THE MEDICAL SCIENCES

FOR OCTOBER 1875.

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

The following works have been received:—

Sur un Nouveau Procédé Opératoire de la Cataracte (Extraction à Lambeau Périphérique); par L. De Wecker. Paris. 1875.

Clinique Ophthalmologique du Dr. De Wecker, à Paris. Relevé Statisque, par le Dr. Masselon, Chef de Clinique. Paris, 1875.

Delle Difficoltá e della Diagnosi in Medecina scritte da Antonio Feroci, Medico Pisano.

Storia di una Gastrite Terminata per Gangrena Seguita da Osservazioni Intorno al Modo Occulto di Procedere di Alcune Malattie del Dott. Car. D. A. Feroci di Pisa. Milano, 1873.

Bad Homburg and its Resources. For the use of English Visitors especially. By Dr. Hoeber, Resident Physician at Homburg. Bad Homburg, 1875.

Reports of the Medical Officer of the Privy Council and Local Government Board: New Series—No. I. Annual Report to the Local Government Board with regard to the year 1873, with Appendix. No. II. Supplementary Report to the Local Government Board on some Recent Inquiries under the Public Health Act, 1858. No. III. Report to the Lords of the Council on Scientific Investigations, made under their direction, in aid of Pathology and Medicine. Presented to both Houses of Parliament by command of Her Majesty. London: Printed by George E. Eyre and William Spottiswoode, Printers to the Queen's Most Excellent Majesty, for Her Majesty's Stationery Office. 1874.

The Gentle Treatment of Spinal Curvature. By Henry Heather Bigg, Assoc. Inst. C. E. London: J. & A. Churchill, 1875.

Manual of Pathological Anatomy. By C. Handfield Jones, M.B. Cantab., F.R.S., and Edward H. Sieveking, M.D., F.R.C.P., Physician Extraordinary to the Queen. Second edition, revised, enlarged, and edited by Joseph Frank Payne, M.B. Oxon., F.R.C.P. London: J. & A. Churchill, 1875.

Researches into the Antagonism of Medicine; being the Report of the Edinburgh Committee of the British Medical Association. By John Hughes Bennett, M.D., F.R.S.E., Chairman and Reporter. London: J. & A. Churchill, 1875.

The Successful Treatment of Internal Aneurism by Consolidation of the Contents of the Sac. By Joliffe Tufnell, F.R.C.S.I., M.R.I.A., President of Royal College of Surgeons, Ireland, etc. Second edition. London: J. & A. Churchill, 1875.

On Poisons in Relation to Medical Jurisprudence and Medicine. By Alfred Swaine Taylor, M.D., F.R.S., Lect. on Med. Jurisp. in Guy's Hospital. Third American from third and thoroughly revised English edition. Philadelphia: Henry C. Lea, 1875.

Vision: Its Optical Defects, and the Adaptation of Spectacles. By C. J. Fenner, M.D. Philadelphia: Lindsay & Blakiston, 1875.

On Paralysis from Brain Disease in its Common Forms. By H. Charlton Bastian, M.D., F.R.S., Prof. of Path. Anat. in University College. New York: D. Appleton & Co., 1875.

Clinical Lectures and Essays. By Sir James Paget, Bart., F.R.S., D.C.L. Oxon., Sergeant-Surgeon Extraordinary to Her Majesty the Queen. Edited by Howard Marsh, F.R.C.S., Assist. Surg. to St. Bartholomew's Hospital. New York: D. Appleton & Co., 1875.

Cyclopædia of the Practice of Medicine. Edited by Dr. H. Von Ziemssen, Prof. of Clin. Med. in Munich, Bavaria. Vol. X.—Diseases of the Female Sexual Organs, by Prof. Carl Schroeder, of Erlangen, Bavaria. Albert H. Buck, M.D., New York, Editor of Am. edition. New York: William Wood & Co., 1875.

The Mucous Membrane of the Uterus, with special reference to the Development and Structure of the Decidua. By GEO. J. ENGELMANN, A.M., M.D., Master in Obstetrics in University of Vienna, etc. New York: William Wood & Co., 1875.

A Series of American Clinical Lectures. Edited by E. C SEGUIN, M.D. No. VI.—Otitis. By C. R. AGNEW, M.D., Clin. Prof. of Diseases of Eye and Ear in Coll. of Phys. and Surg., New York. No. VII.—Capillary Bronchitis of Adults. By CALVIN ELLIS, M.D., Jackson Prof. of Clin. Medicine in Harvard Univ. New York: G. P. Putnam's Sons, 1875.

Cantho-Plasty as a Remedy in Certain Diseases of the Eye. By C. R. AGNEW, M.D., N. Y. New York: G. P. Putnam's Sons, 1875.

Uninology, and its Practical Applications. By GEORGE M. KOBER, M.D. Louisville, 1875.

Tinnitus Aurium. By SAMUEL THEOBALD, M.D., Surgeon to Baltimore Charity Eye and Ear Dispensary. Baltimore, 1875.

Clinical Studies with the Non-nauseating Use of Ipecacuanha, chiefly in Intermittents. By ALFRED A. WOODHULL, M.D., Assist. Surg. U. S. A. Atlanta, 1875.

Open Dressing of Amputation Wounds—Wetted Adhesive Strap. By F. PEYRE PORCHER, M.D., Prof. of Inst. Med. in Med. Coll. of State of South Carolina.

. Fracture of the Inferior Maxillary Bone. By Jos. F. MONTGOMERY, M.D., of Sacramento, Cal.

Self-Injection of the Bladder in the Treatment of the Consequences of Obstructive Enlargement of the Prostate, and the best means of accomplishing it; together with two cases illustrating another method of removing Foreign Bodies from the Urethra. By W. H. VAN BUREN, A.M., M.D., Prof. of Prin. and Pract. of Surgery, etc. in Bellevue Hosp. Med. Coll., and E. L. KEYES, A.M., M.D., Adjunct Prof. of Surgery, etc. in Bellevue Hosp. Med. Coll., New York. 1875.

An Inquiry into the Modus Operandi of the Yellow Fever Poison. By GEORGE M. STERNBERG, M.D., Assist. Surg. U. S. A.

Cases of Disease in the Orbit. By HENRY D. NOYES, M.D., Prof. of Ophthal. and Otol. in Bellevue Hosp. Med. Coll., N. Y. New York: G. P. Putnam's Sons, 1875.

Treatment of Uterine Displacements. By H. F. CAMPBELL, M.D., of Augusta.

A Case of Traumatic Aneurism of the Left Subclavian Artery treated successfully by Distal Compression. By WARREN STONE, M.D., Prof. of Surgical Anat. in Charity Hosp. Med. Coll., New Orleans.

Iridotomy, and its Applicability to Certain Defects of the Eye. By A. W. CALHOUN, M.D., Prof. of Dis. of Eye and Ear in Atlanta Med. Coll. Atlanta, 1875.

The Pathology and Treatment of Chronic Ulcers. By B. A. WATSON, M.D. New York, 1875.

The Influence of the Climate of Colorado on the Nervous System. By CHARLES DENISON, M.D. Denver, 1875.

The Extension Windlass. By CHARLES DENISON, M.D., Denver, Col.

Retention in Utero of the Dead Fœtus, considered particularly with regard to its Effects on the Mother. By G. W. H. KEMPER, M.D., Muncie, Md.

The Physiological Reasons Why: An Essay on School Hygiene, with reference to the Physiological Relations of Age and Sex to Mental and Physical Education, to which the Medical Society of the State of New York awarded the Prize for 1875. By ALEXANDER HUTCHINS, A.M., M.D. Brooklyn, N. Y.

Resumé of a Report on Position, Pneumatic Pressure, and Mechanical Appliances in Uterine Displacements. By HENRY FRASER CAMPBELL, M.D. Atlanta, 1875.

The Gathering, Packing, Transportation, and Sale of Fresh Vegetables and Fruits; Competent Inspection and Free Markets for Producers. By SAMUEL C. BUSEY, M.D., of Washington. New York, 1875.

Preventive Medicine. By CHARLES C. F. GAY, M.D. Buffalo, 1875.

A Report on Trichinosis as observed in Dearborn County, Indiana, in 1874. By GEORGE SUTTON, M.D. Aurora, Indiana.

A Clinical Contribution to the Treatment of Tubal Pregnancy. By T. GAILLARD THOMAS, M.D. New York, 1875.

The Relations of the Nervous System to Diseases of the Skin. By L. DUNCAN BULKLEY, A.M., M.D. New York, 1875.

Alimentation, and the Gastro-Intestinal Disorders of Infants and Young Children. By B. F. DAWSON, M.D., Phys. to N. Y. Free Disp. for Sick Children. New York, 1875.

A New Form of Intra-uterine Stem Pessary, with Remarks upon the General Use of Intra-uterine Stems. By R. A. KINLOCH, M.D., of Charleston, S. C.

History of the Smallpox Epidemic in the city of Mobile, in 1874–5; with Mortuary and Meteorological Tables. Also Notes and Reflections upon Diphtheria and

Typho-Malarial Fever. By JEROME COCHRAN, M.D., of Mobile, Prof. of Pub. Hygiene and Med. Jurisp. in Med. Coll. of Ala. Montgomery, 1875.

Inaugural and Anniversary Addresses delivered before the Medical Society of the State of New York at its Sixty-ninth Session. By the President, GEORGE JACKSON FISHER, M.D., of Sing Sing, N. Y. New York: G. P. Putnam's Sons, 1875.

Address to the Alumni of the University of Virginia at Charlottesville. By Hon. R. M. S. Hunter. June, 1875. Richmond, 1875.

Annual Discourse before the Massachusetts Medical Society, June 9, 1875. By GEORGE H. LYMAN, M.D. Boston, 1875.

Annual Address before the Rhode Island Medical Society, June, 1875. By EDWARD T. CASWELL, A.M., M.D., of Providence. Providence, 1875.

Annual Oration before the Medical and Chirurgical Faculty of Maryland, April 14, 1875. Contribution to the Medical History and Physical Geography of Maryland. By JOSEPH M. TONER, M.D Baltimore, 1875.

Address before the Medical Association of the State of Alabama. By Dr. J. S. WEATHERLY, President. Montgomery, 1875.

Address before the Ohio State Medical Society, June, 1875. By Dr. W. W. JONES, Toledo, President of the Society. Toledo, 1875.

Biographical Memoir of William W. Gerhard, M.D. Read before the Coll. of Phys. of Philadelphia, May 6, 1874. By THOMAS STEWARDSON, M.D. Philadelphia, 1874.

Transactions of Medical Association of Missouri, 1875. Kansas City, 1875.

Proceedings of Florida Medical Association. Sessions of 1874–75.

Transactions of Medical Society of the State of California, 1874 and 1875.

Transactions of the South Carolina Medical Association, 1875. Charleston, 1875.

Transactions of College of Physicians of Phila. Third Series, Vol. I. 1875.

Annual Report of the Board of Health for the City of Boston, 1875. Boston, 1875.

Report of the Board of Health of the City and Port of Philadelphia, 1874.

Report of St. Joseph's Hospital, Phila., 1867–1874. By ROBERT B. CRUICE, M.D.

The following Journals have been received in exchange:—

Deutsches Archiv für Klinische Medicin. Bd. XV., 5 u. 6 Heft; Bd. XVI., Heft. 1.

Archiv für Anatomie, Physiologie und Wissenschaftliche Medicin. No. 2, 1875.

Archiv der Heilkunde. Bd. XVI., 5 u. 6 Heft.

Centralblatt für die Med. Wissenschaften. Nos. 28 to 39, 1875.

Allgemeine Wiener Medizinische Zeitung. Nos. 23 to 36, 1875.

Bibliothek for Læger. Femte Binds, tredie Hefte.

Nordiskt Medicinskt Arkiv. Sjunde Bandet, Andra Häftet.

L'Imparziale. Nos. 12 to 17, 1875.

Lo Sperimentale, 1874. Fascic. 5 to 8, 1875.

Archives Générales de Médecine. Juillet, Aout, Septembre, 1875.

Revue des Sciences Médicales en France et l'Etranger, Juillet, 1875.

Annales de Dermatologie et de Syphiligraphie. No. 5, 1874–75.

Archives de Physiologie Normale et Pathologique. Mai, Juillet, 1875.

Annales des Maladies de l'Oreille et du Larynx. Juillet, Septembre, 1875.

Gazette Hebdom. de Méd. et de Chirurgie. Nos. 24 to 37, 1875.

L'Union Médicale. Nos. 70 to 108, 1875.

Le Mouvement Médical. Nos. 24 to 37, 1875.

La Tribune Médicale. Nos. 357 to 368, 1875.

Le Progrès Médical. Nos. 21 to 35, 1875.

Revue Scientifique de la France et de l'Etranger, Nos. 1 to 11, 1875.

The Retrospect of Medicine. January–June, 1875.

The British and Foreign Medico-Chirurgical Review. July, 1875.

The Lancet. July, August, September, 1875.

The Medical Times and Gazette. July, August, September, 1875.

The British Medical Journal. July, August, September, 1875.

The London Medical Record. July, August, September, 1875.

The Sanitary Record. July, August, September, 1875.

The Practitioner. July, August, September, 1875.

Edinburgh Medical Journal. July, September, 1875.

The Glasgow Medical Journal. July, 1875.

The Dublin Journal of Medical Science. June, July, August, 1875.

The Journal of Anatomy and Physiology, May, 1875.

The Indian Medical Gazette. June, July, August, 1875.

Canada Medical and Surgical Journal. July, August, September, 1875.

The Canada Medical Record. June, July, 1875.

The Canada Lancet. July, August,, 1875.
L'Union Médicale du Canada. Juin, 1875.
The Obstetrical Journal of Great Britain and Ireland. With an American Supplement. July, August, September, 1875.
The Boston Medical and Surgical Journal. July, August, September, 1875.
The New York Medical Journal. July, August, September, 1875.
The Medical Record. July, August, September, 1875.
The American Journal of Insanity. July, 1875.
The American Journal of Obstetrics. August, 1875.
The Psychological and Medico-Legal Journal. June, 1875.
Archives of Dermatology. July, 1875.
Archives of Electrology and Neurology. May, 1875.
New Remedies. July, 1875.
The Buffalo Medical Journal. May, August, 1875.
The Philadelphia Medical Times. July, August, September, 1875.
The Medical and Surgical Reporter. July, August, September, 1875.
Half-Yearly Compendium of Medical Sciences. July, 1875.
The Cincinnati Lancet and Observer. July, September, 1875.
The Cincinnati Medical News. June, July, August, September, 1875.
The Clinic. July, August, September, 1875.
The American Practitioner. July, 1875.
The Medical Examiner. July, 1875.
The Chicago Medical Journal. July, August, September, 1875.
The Chicago Journal of Nervous and Mental Diseases. July, 1875.
The Indiana Journal of Medicine. July, August, 1875.
The Detroit Review of Medicine and Pharmacy. July, August, September, 1875
The St. Louis Medical and Surgical Journal. July, August, 1875.
The St. Louis Clinical Record. July, August, September, 1875.
The Medical Herald. June, July, August, 1875.
The Kansas City Medical Journal. June, 1875.
The Peninsular Journal of Medicine. July, August, September, 1875.
The Pacific Medical and Surgical Journal. June, July, August, September, 1875.
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Virginia Medical Monthly July, August, September, 1875.
The Southern Medical Record. June, July, 1875.
Atlanta Medical and Surgical Journal. July, August, September, 1875.
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The Richmond and Louisville Medical Journal. June, July, August, 1875.
Baltimore Physician and Surgeon. July, August, September, 1875.
The Nashville Journal of Medicine and Surgery. July, September, 1875.
The Sanitarian. August, September, October, 1875.
The American Journal of Pharmacy. July, August, September, 1875.
The Druggist's Circular. July, August, September, 1875.
The Journal of Materia Medica. July, August, September, 1875.
The Pharmacist. July, September, 1875.
The Laboratory. June, July, August, 1875.
The Physician and Pharmacist. August, 1875.
The Dental Cosmos. July, August, September, 1875
The American Journal of Dental Science. July, August, September, 1875.
The American Naturalist. July, August, September, 1875.
The American Journal of Science and Arts. July, August, September, 1875.
The Boston Journal of Chemistry. September, 1875.

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OCTOBER, 1875.

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THE

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## ART. I.—*Progressive Pernicious Anæmia, or Anæmatosis.* By WILLIAM PEPPER, M.D., Physician to the Philadelphia and to the Children's Hospital; Prof. of Clinical Medicine in the University of Pennsylvania, etc.

THE following cases are offered as a contribution to the study of one of the most obscure and ill-understood classes of disease. The improvements in our knowledge of diagnosis, aided by the introduction of the use of organic chemistry and of the microscope into the study of the physical characters of the blood, have led to much attention being devoted of late years to those remarkable affections which present as one of their chief characteristics a profound change in the composition of this fluid. The result has been the gradual establishment of several hitherto unrecognized diseases, and the much more exact description of other already familiar conditions. But, in spite of this decided advance in our knowledge of the symptoms and lesions of these affections, it cannot be claimed that much progress has yet been made in our acquaintance with their true intimate nature or mutual relations. The group of diseases to which I refer may be said to include—without any pretension to fix positively its limits—anæmia in some of its rarer forms; leukæmia; pseudo-leukæmia, adenia, lymph-adenoma, or Hodgkin's disease; and Addison's disease.

They are usually classified under some such heading as General or Constitutional Diseases, because the entire system is evidently affected. But they are clearly distinguished from other general diseases, such as the great class of fevers, by the fact that they are not dependent, so far as known, upon the introduction of any specific morbid principle into the economy; but are due to an essential and progressive alteration of the blood, usually if not always associated with or dependent upon some lesion of the solids.

In view of the progressive mal-nutrition which marks these affections, the term *Cachexia* (constitutional dystrophy of Jaccoud) is correctly used to describe them. There are other features which may be mentioned as distinguishing these Cachexias. For the most part they arise without definite recognizable cause; they are not self-limited, and have no definite duration; their tendency is to an unfavourable termination, and indeed in regard to most of them it may be said that they are invariably fatal.

In placing anæmia in this list of Cachexias, it must be noted that I have limited myself to certain comparatively rare forms only of that condition. Indeed the name anæmia has been so long used in a vague way to cover all cases where there are pallor of the surface and the evidences of poverty of the blood, that it is necessary to define with some care the different conditions which have thus been included.

In the first place there is the true anæmia which follows hemorrhage. Although it may be objected that there can never be *anæmia* or *bloodlessness* in the strict sense of the term, and that consequently the term *hypæmia* should be used, the important fact is that there is a simple reduction in the mass or amount of the blood without morbid change in its elements, and custom has so sanctioned the use of the term "anæmia" that it seems undesirable to discard it.

Secondly, we frequently observe that, when there has been severe loss of blood, or after prolonged suppuration or continued morbid discharges of any kind, there is a diminution in the red globules, and also a reduction in the proportion of albuminous and saline elements, while the bulk of blood remains normal in consequence of an excess in the proportion of water. To this condition the term *hydræmia* appears most applicable.

But, thirdly, there are also cases met with where, although the mass of the blood may be diminished, the chief change is a progressive and often seemingly causeless diminution in the proportion of the red globules. It is evident in such cases that a profound alteration in the blood-making function is present; and it is most probable that the chemical composition and vital properties of the red globules are also affected, and that there is, at the same time, some alteration in the properties of the white corpuscles, though their number or appearance be not materially changed. Still the diminished proportion of red globules is the most striking feature; and as "anæmia" is a particularly bad name for such a condition, attempts have been made to coin some special term to distinguish it. Thus it has been called *oligocythæmia* (ολιγος, *few;* κυτος, *cell;* αἷμα, *blood*), *aglobulia* and *hypoglobulia*. All of these, however, seem open to objection, and have failed to establish themselves in common usage. Jaccoud (Path. Interne, tome ii. p. 820) clearly distinguishes this *essential globular anæmia*, but is, it appears to me, less acute and logical than usual in applying the term chlorosis to it. This name has been for so long a time specially devoted to an affection which presents anæmia among its symp-

toms, it is true, but which has so many distinct peculiarities, and is, on the other hand, wanting in so many of the features of the grave forms of anæmia we are now referring to, that it seems erroneous and confusing to endeavour to include them both under this title. I would therefore much prefer restricting the term "chlorosis" to the disease with which it has long been familiarly connected.

If we were to look merely to the chief physical alteration in the blood, I should be disposed to suggest the name of *anerythræmia* (from ἀ, *privative;* ἐρυθρος, *red;* ἁιμα, *blood*); but it is desirable that the term finally adopted should express not merely this one anatomical condition, but should refer to the pathological nature of the affection. I will postpone, therefore, the suggestion of a name which I trust may meet with approval, until the attempt has been made to determine the pathological nature of the form of anæmia under discussion. (See p. 342.)

In a few cases we are able to clearly explain the production of this globular anæmia. We know, for instance, that some mineral poisons, such as phosphorus, the mineral acids, etc., produce intense anæmia when their toxic effects are thoroughly induced; and that it is probably due to a direct action of the poison upon the globules. But when we leave such cases, we find that an explanation of the various forms of essential globular anæmia demands that we should be acquainted with the manner in which and the place where the red globules are developed: and until this vexed physiological question is definitely settled, it is simply impossible to determine finally the intimate nature and mutual relations of these interesting forms of disease.

For some time the generally accepted view has been that the lymphatic glands and spleen are specially concerned in the maintenance of the normal composition of the blood. It appears that from the lymphatic glands, and probably also from the lymphoid Malpighian corpuscles in the spleen, the white corpuscles are developed and enter the blood. It seems probable that some, at least, of the red globules result from the gradual transformation of the substance of the white cells. Less is known as to the mode and place of death of the red globules, though there is reason to believe that the splenic pulp is specially concerned in this process, while recent observations tend to connect the liver also with it.

But quite recently the brilliant observations of Neumann[1] and Bizzozero[2] have demonstrated the resemblance between some of the cellular elements of the marrow of bones and of the splenic pulp, and have rendered it probable that the former also is connected with the processes of transformation which the blood globules undergo either in formation or destruction. I will now merely state that this discovery has been so fully confirmed by both physio-

[1] Centralb. f. d. Med. Wiss. 1868, p. 689; Arch. d. Heilk. Bd. x. pp. 68 u. 220.
[2] Gazetta Medica Lombarda, 1868, No. 46; 1869, No. 2.

logical and pathological observations, that it may be stated that the marrow of the bones is to be added to the spleen and lymphatic glands as being intimately concerned with the maintenance of the normal morphological constitution of the blood.

Beyond this point physiology has not yet advanced, and one of the most interesting and important fields for pathological research lies in the direction of these cachexias and in attempting to trace their intimate causes, nature, and mutual relations.

My present purpose is to offer a contribution to this important study by calling attention to a peculiar form of anæmia of obscure and fatal character, which has recently been redescribed, as though it were a new affection, under the name of "Progressive Pernicious Anæmia." I doubt not that many who read this article will recall cases in their own experience where, without apparent cause, extreme anæmia developed itself and gradually progressed, in spite of all treatment, to a fatal issue, and where the absence of any gross lesion which was so puzzling during life was corroborated at the autopsy. Many, too, who are familiar with the clinical writings of the last thirty or forty years may recall descriptions of just such cases, recorded under various names, *idiopathic*, *malignant*, or *essential anæmia*, *grave form of chlorosis*, etc., and with a candid avowal of the utter obscurity of their true nature. As the present article has no pretension of being a complete historical memoir upon this form of anæmia, I will limit myself to alluding to the cases of fatal chlorosis by Marshall Hall (Am. ed. *Practice of Medicine*, 1839, p. 367), and especially to the cases of "idiopathic anæmia," to which Addison (Syd. Soc. ed. of his works, 1868, p. 212) refers in the following language:—

"It makes its approach in so slow and insidious a manner that the patient can hardly fix a date to his earliest feeling of that languor which is shortly to become so extreme. The countenance gets pale, the whites of the eyes become pearly, the general frame flabby rather than wasted; the pulse, perhaps, large, but remarkably soft and compressible, and occasionally with a slight jerk, especially under the slightest excitement; there is an increasing indisposition to exertion, with an uncomfortable feeling of faintness or breathlessness on attempting it; the heart is readily made to palpitate; the whole surface of the body presents a blanched, smooth, and waxy appearance; the lips, gums, and tongue seem bloodless; the flabbiness of the solids increases; the appetite fails; extreme languor and faintness supervene, breathlessness and palpitations being produced by the most trifling exertion or emotion; some slight œdema is probably perceived about the ankles; the debility becomes extreme. The patient can no longer rise from his bed, the mind occasionally wanders, he falls into a prostrate and half-torpid state, and at length expires. Nevertheless, to the very last, and after a sickness of perhaps several months' duration, the bulkiness of the general frame and the obesity often present a most striking contrast to the failure and exhaustion observable in every other respect. With perhaps a single exception, the disease, in my own experience, resisted all remedial efforts, and sooner or later terminated fatally. On examining the bodies of such patients after death I have failed to discover any organic lesion that could properly or reasonably be assigned as an adequate cause of such serious consequences; nevertheless, from the disease having uniformly occurred in fat people, I was naturally led to entertain a suspicion

that some form of fatty degeneration might have a share, at least, in its production; and I may observe that, in the case last examined, the heart had undergone such a change, and that a portion of the semilunar ganglia and solar plexus, on being subjected to microscopic examination, was pronounced by Mr. Quekett to have passed into a corresponding condition."

This admirable passage is extracted from Dr. Addison's classical memoir "*On the Constitutional and Local Effects of Disease of the Supra-renal Capsules*," published in 1855; and it gains interest from the fact that it was while studying these cases of idiopathic anæmia that he observed the equally curious cases of anæmia with bronzing of the skin, which he showed to be connected with disease of the supra-renal capsules, and which are now known the world over by his name. It also shows very clearly that this form of anæmia was well recognized, was occasionally encountered, and was made the subject of public clinical discussion before 1850 (although not published until 1855). Unfortunately no microscopic examination of the blood was made.

About this time, however (1845 to 1850), Virchow and Bennett called attention to leucocythæmia or leukæmia, and since then, until very recently, nearly all cases of progressive fatal anæmia have been in some way connected with that interesting disease. It will be remembered that leukæmia is characterized by an extreme increase in the number of white corpuscles in the blood, together with a marked reduction in the number of red globules and the mass of the blood, and that three varieties, *splenic*, *lymphatic*, and *medullary* or *myelogenic*, have been described, according as the chief seat of the lesions is found in the spleen, the lymphatic glands, or the marrow of the bones respectively.

Subsequently it has been found that there exists a form of cachectic anæmia with diffused enlargement of the lymphatic glands (such as occurs in lymphatic leukæmia), which was first described by Dr. Hodgkin (*Medico-Chirurgical Transactions*, vol. xvii. p. 68, 1832), and which may pass through all its stages to a fatal issue without any increase in the proportion of white corpuscles in the blood. This variety of anæmia has been described by several writers under the names of Hodgkin's disease (Wilks); Lymphatic Anæmia; Adenia (Trousseau); Pseudoleukæmia (Cohnheim and Wunderlich). Still further, it has been found that in some rare instances this progressive anæmia, without leukæmic complication, may be connected with enlargement of the spleen instead of the lymphatic glands, thus constituting a *splenic anæmia* (Griesinger), *splenal cachexia* (Wood), or *splenic form* of pseudoleukæmia.

Finally, it has been shown by Ponfick[1] and Wood[2] that in some cases of pseudoleukæmia there may be not only lesions of the lymphatic glands

[1] Ü. d. Sympathischen Erkrankungen des Knochenmarkes bei inneren Krankheiten. Virchow's Archiv. 56, Bd.

[2] On the relations of Leucocythæmia and Pseudoleukæmia, Amer. Journ. Med. Sciences, Oct. 1871, p. 373.

and of the spleen, but also an affection of the marrow of the bones similar to that which is found in some cases of leukæmia. It appears thus that there exist corresponding series of forms of these two affections, as follows :—

| | | | |
|---|---|---|---|
| Splenic<br>Lymphatic<br>Medullary | Leukæmia. | Splenic<br>Lymphatic<br>Medullary | Pseudoleukæmia. |

It is of course understood that, in many cases, lesions of two or even all three of these tissues are associated.

Now it will be found, I believe, that the symptoms of these cases of so-called pseudoleukæmia differ from those of "idiopathic anæmia" as described by Addison, or from the symptoms of the cases I will relate, only in the fact that enlargement of the spleen or lymphatic glands exists in the former.

It becomes then extremely important to study carefully this singular form of anæmia, the more so as there is reason to believe that its nature has been overlooked from Addison's time down to within a few years. I have myself met with three cases which are undoubtedly of this nature. And quite recently, moreover, a series of articles has been published containing the careful descriptions of cases of intense and fatal anæmia with fatty degeneration of the heart and other organs, which it is easy to see are identical with the affection described by Addison. Among the references which I have to such recent articles, the first in order of publication is the following case of "oligæmia," by Dr. Luigi Corrazza,[1] of Bologna, in 1869.

A young woman, 24 years of age, had never entirely regained her health since an attack of continued fever at the age of 15 years. Subsequently she bore four children in five years, and about the middle of her last pregnancy had a severe attack of jaundice, which soon passed away, but left the skin of a dirty-yellowish colour. She was confined in November, 1867, but remained feeble, suffering frequently with diarrhœa, and when admitted to the hospital in January, 1868, presented the following symptoms: No emaciation, surface straw-yellow; marked dyspnœa and restlessness, headache, giddiness on rising, palpitation of heart, sense of weight and distress in stomach; anæmia. The temperature was normal; pulse and breathing accelerated: anæmic murmurs in the large vessels; the liver somewhat enlarged; the spleen and lymphatic glands not affected, and the extremities œdematous. These symptoms became aggravated, with vomiting, increased depression of circulation, and dyspnœa and somnolence, and death ensued on January 27th. At the autopsy there was œdema of the lungs, and some serous effusion in the pericardium and pleural and peritoneal cavities. The blood was very liquid. The heart, liver, and kidneys were fatty. The spleen was slightly swollen.

In the paper of Dr. Wood last referred to, which presents one of the most thoughtful and original contributions to the study of this obscure

[1] Storia di un caso di oligæmia con riflessioni su quest' affezione, sulla clorosi e sulla degenerazione grassosa degli organi, Bologna, 1869. Quoted at length in Meissner on Leukæmia and Pseudoleukæmia, Schmidt's Jahrb., 1872, Bd. 155, s. 333.

class of affections, there is one case at least which corresponds to the essential anæmia we are now considering.

Shortly afterwards, Gusserow[1] published a valuable article containing the careful clinical histories of five fatal cases of intense progressive anæmia, all occurring in pregnant women. In these cases no jaundice was observed, while, on the other hand, albuminuria was detected in one case, and there was some febrile elevation of temperature in several instances; but, with these exceptions, the patients presented the same train of symptoms, without any recognizable organic lesion, which has just been quoted from Corrazza's case. Careful post-mortem examination was made in every instance, and revealed the same conditions of fatty degeneration of the heart and sometimes of the liver and kidneys, with œdema of the lower lobes of the lungs and small amounts of reddish serous effusion into the various cavities. The blood was diminished in quantity; there was no increase in the proportion of white corpuscles, but great diminution in the red globules. The spleen was slightly enlarged, but with no characteristic change in its pulp; the lymphatic glands were not affected.

In the following year, 1872, Biermer, of Zurich,[2] published a very able memoir, based upon the study of fifteen cases of fatal anæmia which he had met with in five years. The majority of his cases occurred in women, and, as in Gusserow's cases, child-bearing seemed to predispose to the disease. He also noticed that in some instances the cause appeared to be chronic follicular catarrh of the intestines. He added to the clinical history of the disease that, late in its course, ecchymoses occasionally appear in the retina or under the skin, and sometimes hemorrhages may occur from the nose or kidneys. But in every essential particular—the gradually and inevitably fatal progress, absence of emaciation, extreme diminution of red globules without increase in number of white corpuscles, absence of lesions of spleen or lymphatic glands, presence of intense anæmic murmurs, passive dropsy, and other signs of alteration of the blood and failure of heart-power, and finally, in the detection of fatty degeneration of the heart and of various organs, as the only organic lesion of the solids after death—in every particular the cases of Biermer agree with those above quoted. With the idea that the affection was a new one, Biermer applied the name "Progressive Pernicious Anæmia" to it. But when the close resemblance between these recent reports and the older but equally clear description by Addison of "idiopathic anæmia" is carefully considered, the conclusion seems to me unavoidable that they are one and the same affection. It is not a little melancholy, if this conclusion be correct, to find that, in the native land

[1] Ü. hochgradigste Anämie Schwangerer, Arch. f. Gynækologie, 1871; Hft. 2, p. 218.

[2] Correspondenzblatt für Schweizerische Aerzte, Jahrgang 2, 1872, No. 1.

of that great clinical master, one of the leading journals[1] accepts "progressive pernicious anæmia" as a disease *sui generis*, and observes that no case has as yet been reported in Great Britain.

Still more recently, Immermann,[2] of Basle, has published two cases of identical character; and Zenker[3] furnishes one more with complete and minute post-mortem examination.[4] In an article published recently (*Boston Med. and Surg. Journ.*, Jan. 14, 1875, p. 33), Dr. James R. Chadwick, of Boston, reports a case of fatal anæmia, apparently due to repeated hemorrhages following delivery, the symptoms and course of which, as well as the results of post-mortem examination, show it to have been identical in nature with the cases hereafter reported. In the *Practitioner* for January of the present year (p. 22), Dr. Broadbent, in a paper on the "Therapeutic Uses of Phosphorus," describes two similar cases, one of which was studied until its fatal termination, and the diagnosis verified by the absence of any organic disease to explain the anæmia. In neither this case nor the one reported by Dr. Chadwick was the marrow of the bones examined. I should also add that in a remarkable memoir, Ponfick[5] has described, from a purely anatomical point of view, at least one or two cases of this form of anæmia, under the name of "The Anæmic Form of Fatty Degeneration of the Heart."

Having now given a hasty sketch of this peculiar affection, and a sufficient number of references to recorded cases to show its comparative frequency, I propose to present the histories of three cases which have recently come under my observation, and then to consider more in detail its symptoms and pathology.

CASE I. *Intense anæmia (of malarial origin?); irregular fever, uncontrolled by quinia; œdema, gastric disturbance, palpitation, hæmic murmurs, hemorrhages, somnolence, coma, and death; no enlargement of spleen or lymphatic glands. No autopsy.*—The following history is chiefly based upon notes kindly furnished me by my friend Dr. R. G. Curtin, under whose care the case was, and with whom I visited the patient in consultation.

Eliza Farrell, aged twenty-six years, single, a dressmaker by occupation, and a tall, stout, hardworking woman, with a good family history. She lived on the outskirts of Philadelphia, in a somewhat malarious neighbourhood. Her father, who lived in the same house, had malarial neuralgia in 1872. In October, 1872, she applied at the Hospital of the University of Pennsylvania with a severe attack of bronchial catarrh, with some loss of flesh; there had been no hæmoptysis, the expectoration being copious, white, and frothy. There were very marked bronchitic râles over both lungs. The attack proved obstinate, but in the course of five months she seemed to have regained her health.

In September, 1873, she came again, complaining of great weakness, which had been increasing for some time. She had also anorexia and irregular fever

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[1] Medical Times and Gazette, Nov. 21, 1874, p. 582.

[2] Deutsches Archiv. f. Klin. Med., 13ten Bd., 3tes Hft., 1874, s. 209.

[3] According to the Medical Times and Gazette, a similar case, without autopsy, has been published by Gfrörer of Heilbronn, but I have not been able to discover the original record.

[4] Ia. Op., p. 348.

[5] Ueber Fettherz, Berlin Klin. Wochenschrift, 1873, No. 192.

in the afternoons, and was decidedly anæmic. She was ordered arsenic, iron, and quinia.

A week later, September 27, she returned, stating that she felt much weaker, and that she now had slight chills in the afternoon, followed by more fever. Her feet and face were puffy, and there was a soft systolic cardiac murmur. The urine was free from albumen. The quinia was increased to sixteen grains daily.

October 11, she seemed better, and was free from fever. Her appetite was better and her feet less swollen, but she was still as weak and anæmic as before. She was ordered liq. ferri acetatis.

After this she grew steadily worse again, and was soon obliged to keep to her bed. She had several hemorrhages from the gums, and when she menstruated the flow was excessive. Her appetite and power of taking food diminished, and the œdema increased decidedly.

On November 4, her condition was as follows: The skin and mucous membranes seemed literally bloodless; the face and feet were very œdematous; the urine was free from the least trace of albumen; she had recently had a hemorrhage from the gums; she could take but very little food without inducing vomiting; the tongue was covered with a white, pasty fur; the bowels had been quiet throughout, though easily moved; there was *no enlargement* of the *spleen*; the mind was clear but sluggish, and there was extreme prostration; there was still irregular febrile action in the latter part of the day, disappearing and reappearing at irregular intervals.

November 14, she was first seen by me in consultation with Dr. R. G. Curtin. She had been steadily growing worse, and was now confined to bed, and any exertion caused faintness, and occasionally nausea and vomiting were caused merely by rising in bed. If possible, she was even more anæmic than before, and the bloodless condition of the cutaneous and mucous surfaces was truly remarkable. There was but little emaciation. There had been more hemorrhages from the gums. She vomited frequently, and could take but little nourishment; œdema of feet and face marked; no enlargement of spleen or lymphatic glands, or evidence of organic disease of any organ; no albuminuria; there were no petechiæ or ecchymoses; the action of the heart was rapid and very feeble; the pulse small and gaseous. There was a very loud anæmic murmur over heart, and remarkably strong venous hum was heard over the large veins, as the jugulars and subclavians. There was also a continuous, quite distinct, humming roar audible over the whole skull during arrest of breathing as well as during respiration; this was especially strong over the longitudinal and lateral sinuses. The patient was conscious of this and described it, saying that the constant roaring was very unpleasant.

The mind was clear, but could be fixed only for a short time on any subject. The patient lay for the most part in a heavy sleep. Microscopic examination showed absence of any increase in white corpuscles, but great diminution in the red globules.

November 28. Increasing weakness and hebetude of mind; condition otherwise much the same; no albuminuria or enlargement of spleen. Has continued to take large doses of quinia and iron, and utmost care has been used to administer nourishment both by the mouth and rectum.

December 4, there was a sudden increase in the swelling of the body, followed by coma, which persisted until her death occurred the following day.

Unfortunately no *post-mortem* examination was permitted, but still it is difficult to doubt the nature of the affection. Although the place of her residence was somewhat malarious, and it may be that malaria may have originally had somewhat to do with breaking down her nutrition, the course of the case, the utter inefficiency of quinia, iron, and arsenic, and the absence of enlargement of the spleen, made it clear that at least the later period of her illness was not merely malarious in character.

CASE II. *Vague symptoms of failing health; slight sunstroke; jaundice; followed by more rapid failure in strength and progressive anæmia; dyspnœa; palpitation; nausea; vomiting; slight œdema; faintness and giddiness on rising; hæmic murmurs; very slight fever; no leukæmia, but extreme anæmia; very slight emaciation; delirium; death. No affection of lymphatic glands; slight enlargement of spleen; fatty degeneration of heart, liver, and kidneys.*—W. G., æt. 57 at time of his death, June 12, 1872. He was a native of England, but came to America at the age of 14 years. He was a short, heavily built man of rather sanguine or plethoric constitution. He enjoyed unusually vigorous health, having had no sickness excepting an attack of measles in childhood; and since then having never had occasion to consult a physician until his last illness. He lived continuously in Philadelphia, and both his residence and place of business were in healthy localities. He was not exposed to malaria or to any metallic poison; being engaged at the head of a large wholesale crockery business. He was a very hard worker, frequently being at his store from 8 A.M. to 10 or 12 P.M. He was very successful and made a great deal of money; though he lost much by endorsing. He was never rendered anxious or overstrained; but was always amiable and took the world very easily. He was very domestic in his habits; was married, and had nine children, who all survived him, though subsequently the youngest son died of acute caseous pneumonia. There is not the slightest suspicion of his ever having had syphilis. He was temperate in his habits, eating heartily of simple food, and drinking ale moderately. He had never suffered from chronic diarrhœa.

For two years previously his sons had assumed chief charge of the business, and in consequence he was much less occupied than it was his habit and wish to be; and this enforced idleness after a life of great activity was irksome to him. In July, 1871, while sitting in a chair in the hot sun overseeing some repairs to his store, he had a slight sunstroke or syncopal attack. He grew faint and almost fell from the chair, but recovered in a few hours and did not seem to suffer from it afterwards. His wife states, however, that even for some months before the above attack, she remembers that he would occasionally strike himself over the breast, and cough, saying that there was something there which would eventually cause his death. It is probable that during this time there was a slow and gradual failure in vigour, although he never alluded to any symptom of ill health. In the following March (1872), he began to be jaundiced. The yellowness came on without apparent cause, with no pain or symptom of calculus. The urine was high-coloured, but the feces were not pale. He was constipated, his appetite began to fail, and, though he continued to attend to business, he lost strength rapidly and his flesh failed and grew flabby and soft. After about a month, the yellowness gradually diminished; but left the surface of a deathly pale color, with a tinge of sallowness, strikingly like the colour of a corpse. His weakness increased, but he still continued to attend to business until towards the middle of April, when he fainted in his store and had to be carried home. He then only left his house to drive in the afternoon, but soon after fainted while in his carriage, and thenceforward did not leave his house. His weakness increased so much that during the first week in May he was compelled to go up stairs on his hands and knees, as walking up exhausted him so greatly. He now noticed that any exertion produced great nausea, with retching and vomiting; and indeed, for a couple of weeks after the

development of the peculiar corpse-like appearance, his appetite was lost entirely so that he loathed food and frequently vomited after having forced himself to eat. Greasy food was especially repugnant to him.

I saw him first on May 10th. He was then confined to his bed. He made no complaints of pain in head or elsewhere, nor indeed of anything but constant sense of great weakness. Every exertion, even that of rising in bed, caused great faintness. The entire surface was deathly pale, with a faint sallow, cadaveric hue. The conjunctivæ were pearly white; the mucous membrane of the mouth entirely bloodless. There were no ecchymoses or petechiæ on any part of the surface. Vision was not disturbed, but no ophthalmoscopic examination was made. There was a distinct puffiness of cellular tissue under eyes, but no œdema in any other part. The tongue was intensely pale, moist, and clean. There was no appetite; and food was ill borne, great care being needed to avoid exciting vomiting. The abdomen was rather large and distended with flatus, and was free from any serous effusion. The bowels were quiet and rather costive, but were readily moved by enemata. The movements were small but apparently normal, containing no excess of free fat, and not pale in colour. There never was any hemorrhage from the bowels. The urine was no longer dark-coloured, but was of normal character and entirely free from albumen. There was no pain complained of in abdomen. The liver and spleen were not enlarged or sensitive.

Respirations were quiet, though easily disturbed by any exertion; no cough; physical examination showed that the lungs were entirely healthy. The heart's action was somewhat frequent, when the circulation was quiet; the pulse was about 90, but exertion readily disturbed it. The area of dulness was normal or very slightly increased; the apex beat very feeble; on auscultation no valvular murmur was detected; the first sound was weak and poorly developed; over the base a soft hæmic murmur was audible, which could be traced along the pulmonary artery; no venous hum could be detected in the neck. Microscopic examination of the blood showed no absolute increase in number of white corpuscles, but very advanced decrease in the red corpuscles. The fluid was thin and dirty-red in colour. The record of the temperature has been lost, but it was but slightly above normal.

The treatment ordered consisted of careful alimentation by stomach and rectum; carbonated water, bismuth, soda and creasote mixture at different times to relieve nausea, which was held in check so that vomiting was comparatively rare towards close of life. The following was also administered: ℞. Quiniæ sulph. gr. ij; strychniæ sulph. gr. $\frac{1}{10}$; tinct. ferri chloridi, gtt. viij; acid. muriatic. dilut. gtt. v; syr. zingiberis, ʒi; aquæ, ʒiij. Ft. sol. S. thrice daily in water. This was well borne for a while; subsequently various changes were made in the form of iron and quinia, but these were the drugs chiefly relied on. Transfusion was not performed. The case was regarded as one of idiopathic anæmia with advanced fatty degeneration of the heart. The jaundice was regarded as having been of hæmic origin.

From this time until death, June 12, 1872, rather more than four weeks later, no marked change occurred in his symptoms. The vomiting was checked, but no appetite returned. The anæmia grew more and more profound. No hemorrhage took place, but examination of the blood showed increasing alteration, but without any increase in the proportion of white corpuscles. There was no improvement in his strength. Towards the

close the feet grew œdematous and a small amount of ascites supervened. Death finally occurred from sheer asthenia, with mild wandering delirium. The degree of loss of flesh remained moderate until the end.

*Autopsy.*—Intense anæmia as above described. There was very little blood in the vessels, and this was thin and watery, of light dirty-red colour, almost without coagula, even in right side of heart. Microscopic examination gave same results as before.

There was still a considerable amount of adipose tissue in omentum, abdominal walls, and other parts of subcutaneous tissue.

*Head.*—Brain very pale and bloodless; increase of subarachnoid effusion.

*Thorax.*—*Lungs* healthy, very pale and anæmic, excepting posterior part of lower lobes, which were œdematous and congested; no pleural effusion; a small amount of clear serum was found in the pericardial cavity; and the surface of the heart presented a number of small ecchymoses. The *heart* was slightly enlarged; presented a considerable amount of fatty accumulation on its outer surface, and on being removed from the chest was found so flabby and relaxed as not to retain shape at all when laid on a flat surface. Its cavities were slightly dilated, and contained some thin watery blood with a few soft small clots. The muscular tissue was very soft, tore readily, was of a pale yellowish-red colour, and on microscopic examination presented an *extreme degree of fatty degeneration.* The aorta and large veins were healthy.

The *liver* was of full size, soft, friable, pale and yellowish in patches. Examination showed extreme general fatty degeneration of the tissue. The gall-bladder contained thin pale bile, no calculi. The *kidneys* were rather large, pale, and very far advanced in fatty degeneration.

The *supra-renal capsules* were of full size, apparently healthy, presenting no characteristic cheesy degeneration.

The *spleen* was somewhat enlarged (half more than natural), its pulp was dark and much softened; no leukæmic lesions present.

The *lymphatic glands* were nowhere involved. The *marrow* of the bones was unfortunately not examined.

The characters of this case are so well marked as to need no comment. At the time that both this and the previous case occurred, no report of the recently observed cases of Gusserow and Biermer had reached my notice, and I find that I have simply headed the latter record with the title "*pernicious anæmia, with fatty degeneration.*" During life, the diagnosis was very obscure, except so far as the cardiac and hæmic lesions were concerned, and so far as an utter absence of the symptoms of organic disease of any other part. The case was regarded as one of acute fatty degeneration, dependent upon primary intense anæmia, and I was inclined to refer the occurrence of jaundice, without apparent cause and followed by such rapid and intense destruction of red globules, to a hæmic origin. The slight sunstroke or syncopal attack cannot, it seems to me, be regarded as in any way the cause of the subsequent cachexia, but as merely a sign of insidious failure in strength and vigour and power of resistance which had previously been slowly progressing. Unfortunately it was impossible to make any special examination of the marrow of the bones. The entire absence of any increase in the number of white corpuscles was repeatedly determined.

In the following case, of recent occurrence, a more minute study of the symptoms and lesions was made; and it will, I trust, prove of interest as showing for the first time, so far as I know, the important fact that this peculiar form of progressive anæmia may be associated with changes in the marrow of the bones such as has been shown to exist in certain cases of leukæmia.

CASE III. *Chronic follicular catarrh; attacks of hepatic colic; mental and bodily overstrain; apparently causeless anæmia and debility; tendency to syncope; transient œdema; hæmic murmurs; dyspnœa; irregular fever; somnolence; transfusion, with temporary relief; increasing debility; ecchymoses; wandering delirium; second transfusion; death in twelve hours. Calculus retained in gall-bladder, with chronic suppuration of the sac; enlargement of solitary follicles of intestines; intense anæmia; fatty degeneration of heart, liver, and kidneys; slight swelling of spleen; no affection of lymphatic glands; marked affection of medulla of bones.*—E. C., æt. 50, engaged in iron founding. He and his brother have worked intensely hard, elaborating patents and carrying heavy business cares. He always discharged the financial part of the business. A man of rather spare frame, never weighing over 130, lithe and active in body and mind. Never enjoyed what could be called vigorous health. At age of twenty-five years he had a very severe attack, attended with vomiting, pain in right hypochondrium, but with no jaundice. Since then he has never been so well as previously, but every year or two has had a similar but less severe attack. In no case did jaundice follow. There has been, besides, a weak condition of the bowels ever since, the stools being habitually undigested and thin, though rarely amounting to more than one a day. No distinct account can be had of any hemorrhage from the bowel having occurred. He suffered for many years (twelve to fifteen) from an obstinate form of psoriasis, chiefly affecting legs, and to a less extent the arms and trunk. These affections did not diminish his energy and activity. He lost nearly all of his upper teeth twelve to fifteen years ago, and could not be induced to wear false ones, so that this must have aided in interfering with his nutrition by preventing complete mastication. He was married, and had a healthy family. He was strictly temperate in every respect, and resided in a healthy suburb of Philadelphia.

He seemed in his usual health till the early part of February, 1875, although subjected to unusually severe strain during the past two years of business depression. About the tenth of that month he did an unusually hard day's work, and noticed next morning that he was feeling poorly and weak. He consulted his sister, Dr. Hannah T. Croasdale, who prescribed rest and tonics. However he continued as usual at his business until early in April, when his debility had become so extreme that he was compelled to remain in his chamber. For some short time before this, he noticed shortness of breath on exertion; and on April 10, there was a rather abrupt appearance of œdema of face and extremities. There had been no diarrhœa or hemorrhage, or exhausting influence of any kind to produce this steady increase in prostration. At the same time, an alarming state of pallor of surface developed itself, the skin becoming excessively pale, with a faint sallow tinge. After the occurrence of the œdema he remained for the most part in bed until his death. The swelling rapidly disappeared, and there was no return of it subsequently. He continued able to take nourishment naturally; was free from suffering, and took interest in everything, retaining his faculties perfectly.

During this time he took iron in various forms and in quite large doses, but it did not seem to agree with him; his stools being very black and his appetite failing. The heart's action was feeble, with occasional intermissions; and a strong hæmic murmur was heard over the base. The pulse was weak—not much accelerated. No record of bodily temperature was made; it is probable that he had slight irregular fever. There was no vomiting. He also had two short attacks of pain in right hypochondrium, with nausea. His ability to take food steadily declined, and latterly he was obliged to be nourished in great part by enemata of beef extract.

I first saw the patient April 30, 1875, in consultation with Dr. Charles H. Thomas and the patient's sister, Dr. H. T. Croasdale, at 12 o'clock noon. A few hours previously he had been subjected to some exertion—having his clothes carefully changed and being gently carried from one room to the next. This was followed by dangerous syncope—entire unconsciousness lasting for a moment. Brandy was given in small quantities every 20 or 30 minutes, and he gradually rallied to a slight degree. He was found lying in bed with his head slightly lowered. His facies was strictly corpse-like—deathly pale, with a trace of sallowness—but without a vestige of healthy colour. Conjunctivæ pearly white; lips blanched; gums bloodless; tongue dry, very pale, coated on dorsum. No coolness of surface. Lies with eyes closed, and dozes constantly; can be readily aroused, and opens eyes, looks intelligently, understands, and answers clearly. Has sense of intense weakness; and this is so much aggravated after sleep that he is afraid to sleep more than a few minutes, and is accordingly awakened every 30 minutes.

Respirations are regular, quiet, with healthy vesicular murmur; pulmonary resonance unusually marked. Pulse weak, quick, compressible, 96 to 102 in minute, somewhat irregular, with occasional intermissions (1 to 3 in every minute). Heart's action similar; soft, musical, hæmic murmur at base, heard along pulmonary artery and less strongly over aorta; no venous hum in neck; no murmur heard on auscultating head. No emaciation, the degree of flesh being very little less than when in ordinary health.

There is no œdema of any part. No petechiæ or ecchymoses.

Abdomen normal; no ascites; liver not enlarged, nor sensitive; spleen slightly enlarged. Nausea and vomiting provoked by any exertion. Frequent administration of small quantities of brandy was directed, together with beef extract by enema.

Transfusion was recommended without delay, and at 6.30 P. M., same day, was performed by Drs. T. G. Morton and C. T. Hunter.

At 6.25, just before operation. Pulse 98, 2 intermissions in minute; temperature in right axilla 101° F. Microscopic examination of blood showed no real excess of white corpuscles, but some relative excess in consequence of extreme reduction in number of red globules; there was but little formation of rouleaux; the individual corpuscles seemed pale, and less biconcave than normal; no abnormal elements were seen. The power used was a Tolles' one-fourth inch.

His brother furnished the blood, which was carefully defibrinated, and ℥ivss slowly injected into right median basilic vein. The operation was effected without the least inconvenience. During entrance of blood there was at first some increased frequency of pulse to 108, but it then fell to 90, becoming stronger and fuller, and losing the intermissions. He experienced some sense of increased strength; but no change occurred in his appearance.

At 7.30 P. M., one hour afterwards, he complained of chilly sensations

("creeps") along spine—succeeded at 7.45 by free vomiting and copious and repeated involuntary evacuations of the bowels, with abdominal pain. The pulse rapidly increased in frequency to 120, becoming much weaker and markedly irregular, and the surface grew much hotter. Sp. ammoniæ aromat. and brandy were given, and hot-water bottles placed around him, with but slight effect. At 8.30 a suppository containing morphiæ sulph. gr. ¼ was given.

At 9 P. M., abdominal pain relieved; necessary to keep windows wide open to furnish air; temperature in right axilla 104¼° F.; pulse 128, weak and compressible, and intermittent; skin moist.

By 11.30 P. M., the pulse had fallen to 100, still weak and intermittent.

*May* 1, 1875. At 1 A. M., pulse 104; respiration 20; temperature 101°.

At 2.30 A. M., pulse 92, 2 intermissions.

At 5 A. M., pulse 90, full and regular—no intermission; temperature 100°. During night he slept, being awakened every half hour to avoid excessive depression. At 4 A. M, he said he felt undoubtedly better. He took brandy and water every half hour, and a small amount of beef extract by mouth. No enemata were given. The pulse lost somewhat in volume in early morning, and one or two intermissions were noted in each minute.

The first urine voided after the transfusion was unavoidably lost; and it was not examined until early on morning of 2d, when it was found clear and amber-coloured, sp. gr. 1018, free from albumen.

During the remainder of the day, there was steady and decided improvement, as may be seen by following record:—

| | Pulse. | Respiration. | Temp. |
|---|---|---|---|
| At 11.30 A. M. . . . | 96, 2 intermissions, | 18 | 101° |
| 3 P. M. . . . . | 98, no intermissions, | 18 | |
| 6 P. M. . . . . | 88, no intermissions, | 18 | 101° |

During this day, he was nourished by the whites of uncooked eggs (of which five were taken) stirred with brandy and water, to which occasionally a little cream was added; and enemata of beef-tea with a few drops of laudanum. The entire amount of brandy taken in last twenty-four hours was f℥iij. Elix. bismuth, pepsin, and strychnia in f℥j doses was given five times a day.

2*d*. Had passed a good night, sleeping nearly two hours at a time. His pulse was of fair volume, without intermissions, and varied from 93 to 97; respirations were regular, and continued at 20 in the minute; temperature at midnight was 100¼°; at 6 A. M., 99°; at 3 P. M., 99⅝°. He urinated quite freely; the secretion was clear and free from albumen, but was not examined microscopically. His intellect was clear, and he expressed himself as feeling stronger. There was still extreme desire for fresh cold air, so that all the windows in his room were kept open day and night. He complained of no pain. No petechiæ or hemorrhages. He took food as on previous day, and without nausea or vomiting. Bowels quiet; rectum retentive; enemata of beef juice f℥ij, tr. opii. gtt. vi, quiniæ sulph. gr. iv, given three or four times in twenty-four hours.

3*d*. General condition seemed slightly more favourable. He slept better and with less exhaustion. Bowels opened spontaneously and naturally. Took nourishment more willingly; and also retained the enemata of beef-tea. Pulse continued about 96, without intermission; temperature varied from 98⅘° to 100°. No positive diminution in degree of anæmia.

4*th*. Did not seem quite so well. Had passed a fair night, but was rather weak and chilly this morning; still craved fresh air and felt faint if

the windows were closed at all. Pulse varied from 95 to 100, and again presented one intermission in each minute; temperature 99°. Less relish for food. Tongue more thickly coated, and brownish and dry on centre of dorsum; anæmia intense. Same nourishment was continued; with enemata as before. He was now ordered tr. ferri chloridi, gtt. iij, liq. pepsin, f℥j, t. d. after meals, in place of the elixir he had been using.

*5th.* A marked change in weather had occurred, and it was thought he had taken cold in consequence. He seemed decidedly less well, and had greater sense of prostration. Pulse had risen to 106 or 108, was less full, and extremely feeble; respirations had risen to 25; temperature rose from 101⅘° at 8 A. M., to 103⅘ at 8 P. M. He urinated more frequently —about every two hours—but none was secured for examination; bowels quiet. The same nourishment (raw eggs, cream, and brandy; milk and lime water; beef-juice) was continued, but the amount of brandy was increased by adding half fluidounce to each enema; the amount of quinia by enema was increased to gr. xvi daily, and tr. digitalis gtt. viij every four hours was substituted for the iron. There was no cough or sign of pulmonary trouble. The anæmic heart-murmur was distinct. The tongue continued brownish and dry. He was also ordered a suppository of morphia gr. one-eighth at night.

*6th.* The febrile exacerbation seems to have diminished, the pulse still somewhat accelerated, 100 to 102. Has had a very comfortable night, and feels refreshed. General condition much the same. Tongue has quite thick brownish coating in centre. No appetite, but no nausea or vomiting. Loathes alcohol. Has had natural, spontaneous movement of the bowels. A slight livid appearance was noted this morning in face. It was decided to repeat the transfusion, and at 12.40, f℥vss defibrinated blood was injected by Drs. T. G. Morton and C. T. Hunter into *left* median basilic vein at bend of elbow. Dr. S. Weir Mitchell was also present, and kindly assisted in making the observations on the pulse during the operation. Just before operation temperature was 101⅕°; pulse had risen from excitement from 108 to 120, not intermittent.

During injection of first syringeful, pulse remained 120, but grew intermittent, losing three or four beats in minute.

During injection of second syringeful, pulse rose during first quarter of minute to 33; and during second quarter to 35.

After the injection of three syringefuls a pause was made for about two or three minutes, during which pulse rapidly fell to 108 per minute.

The third syringeful was injected very slowly, occupying just one minute; during this the pulse was in the successive quarters, 28, 27, 28, 28; and during injection of fourth syringeful, 29, 29, 27, 27.

The operation was accomplished without pain or discomfort to the patient. As soon as it was over he said he was glad it had been done, and that he felt a little stronger. No perceptible change in appearance. Pulse continued to fall to 100, and then in course of thirty minutes was 104, with one or two intermissions.

At 1.30, very soon after the operation, nausea began, and he soon vomited; at same time there was rumbling in bowels, with involuntary discharge of fluid feces. These symptoms at first seemed much less severe than after the first transfusion. But in a short time the pulse and temperature began to rise (see table); his color grew livid, with great restlessness and complaints of pain in the head. This restlessness increased, and was very distressing from two until six o'clock, with constant tossing of hands about, although prostration was evidently steadily increasing. Later he grew more quiet, and at 9.30 he was unconscious.

| Date. | Hour. | Pulse. | Resp. | Temp. F. | Remarks. |
|---|---|---|---|---|---|
| 1875. | | | | | |
| Apr. 30 | 12 noon | 96–102, intermittent | 20 | | |
| | 6 P. M. | 98, intermittent | ... | 101° | Transfused f℥ivss at 6.25 P.M. |
| | 9 P. M. | 128, interm't & feeble | ... | 104⅕ | Probably higher about 8 P.M., but not observed. |
| | 11.30 P. M. | 100, intermittent | 20 | ... | Temperature falling. |
| May 1 | 1 A. M. | 104, intermittent | 20 | 101 | |
| | 2.30 A. M. | 92, intermittent | | | |
| | 5 A. M. | 90, regular, more full | ... | 100 | |
| | 11.30 A. M. | 96, intermittent | 18 | 101 | |
| | 3 P. M. | 98, regular | 18 | 101 | |
| | 6 P. M. | 88, regular | 18 | 101 | |
| | 12 midnight | 94, regular | 20 | 100⅘ | |
| May 2 | 6 A. M. | 96, regular | 20 | 99 | |
| | 3 P. M. | 96 | 20 | 99⅘ | Condition comfortable. |
| | 12 midnight | 96, intermittent | 20 | 98⅘ | |
| May 3 | 9 A. M. | 90, intermittent | 18 | 99 | |
| | 6 P. M. | 96, regular | 20 | 100 | Condition very satisfactory. |
| | 12 midnight | 96, regular | | | |
| May 4 | 3 A. M. | 100, feeble | 20 | | |
| | 6 A. M. | 98 | 20 | 99⅘ | |
| | 12 noon | 94, intermittent | 18 | 99 | |
| | 6 P. M. | 100, regular, weak | 20 | | |
| | 11 P. M. | ..... | ... | ... | Feels chilly. |
| May 5 | 1 A. M. | 107, very feeble | | | |
| | 4 A. M. | 107, extremely weak | | | |
| | 8 A. M. | 106, a little stronger | 24 | 101⅘ | Increased febrile action; ordered digitalis, and increased amount of quinia. |
| | 8 P. M. | 108, regular | ... | 103⅗ | |
| May 6 | 5 A. M. | 100, regular | 18 | 100 | |
| | 10 A. M. | 102 | ... | 101 | |
| | 12.50 | 129 | ... | 101⅘ | At 12.50 transfused f℥vss bl'd. |
| | 2.15 P. M. | 120 | ... | 104 | Vomiting and purging at 1.30 P. M.; lividity. |
| | 3 P. M. | 150, intermittent | 24 | ... | Complains of pain in head. |
| | 4.15 P. M. | 124 | ... | 103⅘ | Very restless from 2 until 6, tossing arms about, etc.; after that unconscious. |
| | 5.30 P. M. | 128 | ... | 104⅘ | |
| | 6.45 P. M. | 119 | ... | 104 | |
| | 8.30 P. M. | 120 | 16 | 103⅘ | |
| | 9.30 P. M. | 130 | 18 | 105 | |
| | 10.30 P. M. | 120 | 15 | 105 | |
| | 12 midnight | 120 | 18 | 106 | |
| May 7 | 1 A. M. | 124 | 13 | | |
| | 2 A. M. | 140 | 11 | | |
| | 3 A. M. | ..... | ... | ... | Expired. |

A suppository of morphia gr. one-eighth was ordered just before the operation; but by accident suppositories containing gr. one-fourth had

been substituted for them, and one was administered at 12.20, 1.45, and 3 o'clock. No further evacuations occurred. At 3 A. M., May 7th, he quietly expired.

In morning of this day, May 6th, some hours *before* transfusion was performed, the minute petechiæ described in post-mortem account made their appearance; but the nurse did not call attention to them.

It is doubtful if the morphia had any influence upon the results of this second transfusion. The amount taken was not large (only 1 grain in all), and the symptoms, excepting the relative slowness of breathing, were such as are frequently observed before death after transfusion.

*Post-mortem Examination.*—The body did not present the slightest evidences externally of decomposition, nor was there any odour to indicate it. The surface was intensely pale. Over the shoulders and the front of the chest and trunk, there were numerous minute petechiæ; a few very small ones were also seen on humeral regions and thighs. There was no œdema of any part of the body; over the legs, and to a less extent on the arms there were still to be found traces of an old eruption, in oval or reddish patches of various sizes where the skin is dry, irregularly thickened and covered with shining scales (psoriasis). There was a fair amount of fat in the subcutaneous tissues as well as on the omentum, the pericardium, and diaphragm.

*Thorax.*—The costal cartilages were very firmly ossified. The cartilage cells exhibited no disposition to proliferation, but many of them contained more than the usual amount of oil in small and large drops. There were about four fluidounces of reddish serum, like claret and water, in the left pleural sac, and about two ounces on the right side. There were a few slight adhesions over apices of lungs. The anterior parts of the lungs were anæmic and pale, while the posterior portions were dark, congested, and œdematous. No ecchymoses or spots of infarction were found.

The pericardium was apparently healthy, and not stained by imbibition; it contained one fluidounce of bloody serum, which showed under microscope a few epithelial cells from the serous membrane, and a very few red globules, very faintly visible. On cutting the vessels of the heart, soft, dark clots escaped from the aorta, pulmonary artery, right auricle, and vena cava. The lining membrane of heart and great vessels was deeply stained. The right ventricle contained a moderate amount of dark, partly fluid blood, which was beginning to decompose and contained minute bubbles of gas; the left ventricle was almost entirely empty. The heart was so flabby that it did not retain its shape in the slightest degree when placed on a flat surface. The muscular structure was very soft, friable, and pale. The walls of the right ventricle were thinned, and especially soft and pale. There was no valvular lesion. The aorta showed a few small patches of atheroma. Fragments from wall of right ventricle showed under microscope, not much free interstitial oil, but almost entire loss of striation; only in a very few fibres could a trace be detected, while the vast majority were in a state of advanced granular and fatty change. The fibres were very friable, and were broken in very small fragments in teasing them out.

Fragments from wall of left ventricle, from small trabeculæ, and from septum ventriculorum, all showed same extreme degree of degeneration.

*Blood.—Clot from right auricle:* fibrin well clotted, but, at first sight, apparent absence of red corpuscles; almost normal number of white corpuscles were seen, revealing normal nuclei on treatment with acetic acid.

On very careful focussing with quite high power (one-tenth) it was seen that the red globules were indistinctly visible, appearing as faint shadows, as though almost entirely dissolved in the serum. Not a single red corpuscle could be found which was distinct.

*From Portal Vein:* about fʒij drawn directly into clean silver spoon and placed directly in small bottle. Eleven hours later no clot had formed. On looking at drop under glass, a moderate number of white corpuscles and a few filaments of fibrin were visible, but at first no red globules. A misty appearance was observed all over field, which was cleared away by acetic acid, and by careful focussing with a one-tenth Tolles' could be resolved into very faint, almost indistinguishable red globules.

The *liver* was of normal size; its surface was quite pale, except where stained from contact with the colon, and also presented irregular patches of very light yellowish colour. Its veins contained a fair amount of dark fluid blood. The liver substance was fatty to a considerable degree. There was a good deal of free oil in small and large globules. A good many cells were stuffed with oil globules, but in many others the contents were merely strongly granular and the nucleus could be seen. No appearance of disintegration of cells. Some small dark masses, like aggregations of pigment granules, were seen.

The *gall-bladder* was much contracted, not having capacity of more than fʒij or fʒiij; its walls thickened and fibrous. The mucous membrane presented a few small ecchymoses, but was smooth and not ulcerated. It contained a rounded blackish calculus, over one-half inch in diameter, and about two fluidrachms of thick puriform fluid, which presented none of the microscopic elements of bile, but abundant cylindrical epithelium, and very numerous pus corpuscles (granular nucleated leucocytes) closely resembling the medium-sized cells found in the marrow. The *bile-ducts* throughout the liver contained pale, but apparently healthy bile. There was no obstruction of the cystic or common duct.

The *stomach* was of ordinary size, the mucous membrane pale, and showing a few small ecchymoses, but otherwise healthy.

The *spleen* was slightly enlarged; the corpuscles healthy; on handling it, distinct crepitation was perceived, owing to decomposition of its tissues, despite the general good preservation of the corpse. The splenic pulp was softened and purplish, without any leukæmic patches or enlarged Malpighian corpuscles. Under the microscope the field was crowded with small round cells (smaller than the majority of the cells in the marrow), spindle-shaped cells, and very pale red blood globules.

The *supra-renal* capsules presented no special change; the central cavities seemed somewhat too large.

*Kidneys.*—Capsules healthy; tissue intensely pale and softened; cortex not diminished; tissue opaque and cloudy; epithelium very fatty and granular; many tubules choked with fatty epithelial cells or granulo-fatty detritus; no increase of interstitial tissue.

*Urine.*—No blood globules; numerous large crystals of uric acid, and quite numerous hyaline casts with a few epithelial elements contained; in some cases, also, granular collections in the casts. In one instance a tube cast composed entirely of fatty epithelial cells was seen. Urine highly albuminous. It was the first urine passed after the second transfusion.

The *pancreas* was of normal size, extremely pale, but apparently healthy. Its tissue showed under the microscope quite abundant free oil, with a granular condition of the cells, but without any excess of connective tissue.

*Small Intestines.*—The walls were thin, pale, and softened; the mucous membrane was pale and especially thin. There was no enlargement of Peyer's patches, but the solitary glands throughout the small intestine, and especially in the ileum, were enlarged and prominent, showing chronic follicular irritation. There was no disease of the large intestine. The mesenteric glands were not materially enlarged.

The *general muscular system* was fairly developed, and was of natural colour and consistence. Microscopic examination of fibres from muscles of forearm showed a healthy condition.

There was a most singular absence of *blood* in all parts of the body (excepting posterior parts of lungs, right side of heart, and veins of liver), so that the remainder of examination was almost unattended with any escape of blood, even after the abdominal vessels were freely opened.

The *brain* was large, with some excess of subarachnoid effusion. The gray substance was very pale: the medulla entirely anæmic. The Pacchionian bodies were large.

*Marrow* from canal of radius appeared decidedly paler than in health; examined in fresh condition it was found to be made up almost entirely of granular cells, round or nearly so, but varying in size from a diameter of $\frac{1}{3500}$ to that of $\frac{1}{2000}$ of an inch. Many of the larger of these cells exhibited a single distinct spherical nucleus without the aid of reagents. The smaller cells often failed to exhibit such nucleus before addition of acetic acid, after which, however, as a rule, it was distinctly displayed. A few of these cells also were granular to a marked degree, and a smaller number contained a single drop of fat. There was also a very moderate amount of free oil in large drops.

Marrow from sternum quite red; very little oil; made up of crowded cells, roundish and granular; on treatment with acetic acid, showing in most cases a single round faintly granular nucleus; the cells varying in size from less than a white blood cell to twice that size, the smaller ones preponderating.

It is evident, on reading these cases, two of which were observed without any knowledge of the reports of similar cases, and on comparing them with these reports, that we have to do with a very definite and well-marked condition of disease—not at all new, because it was clearly recognized by Addison under the name of "idiopathic anæmia," and because it is certain that isolated cases have been observed by different authors; but more distinctly and minutely described of late in consequence of our greater knowledge of diagnosis, and particularly of the distinctive features of the various cachexias.

Like all analogous diseases, this peculiar form of anæmia is not limited to either *sex* or to any *age*. The recent German observers found it more frequent in women, but two of the cases which I have observed were in men. Addison speaks of it as occurring generally, but not exclusively, beyond the middle period of life. Biermer's cases ranged between 18 and 52 years of age; Immerman's were 18 and 31 years old respectively; Gusserow's five patients were from 24 to 36 years old; and in my own cases, the age was respectively 26, 50, and 57 years. If age has any influence upon the production of this affection, which seems to me doubtful,

it may be that, excepting in cases developed in connection with pregnancy, it is more apt to occur about the middle period of life.

As so many cases were observed in the course of a few years at Basle and Zurich, Immerman (*loc. cit.*) suggested that there might be some local cause to explain this rare form of anæmia; but this idea is clearly disproved by the occurrence of similar cases at Dresden, Bologna, in this country, and elsewhere.

*Pregnancy* would certainly seem to act as a predisposing cause. Gusserow described his cases under the title of "very intense anæmia of pregnant women." Although it is met with in men and non-parturient women, a large proportion of cases so far observed have been in connection with pregnancy, and especially when there have been frequently repeated previous pregnancies. Thus in Corrazza's case there had been four pregnancies in five years; Biermer noted that child-bearing appeared to have acted as a predisposing cause; in one of Gusserow's cases there had been six children born in nine years; in another case, seven children in twelve years; in another, the patient, twenty-nine years old, was in her sixth pregnancy; in another, the patient, twenty-nine years old, was in her tenth pregnancy, having given birth to nine healthy children in nine years. In but one of his cases was the patient a primipara, and in that instance there were extreme over-fatigue, anxiety, and privation in addition. Long ago Cazeaux[1] contended for the existence of a marked tendency to anæmia during pregnancy; and when we consider the profound nutritive changes which attend that state, and the heavy demand which is made upon the maternal system, it is not difficult to understand that when repeated with excessive frequency and rapidity, or if accompanied by depressing influences, a grave and even fatal disturbance of the blood-making function might result. It is, in this way, that it is not uncommon to observe not only the form of anæmia we are considering, but all of the cachexiæ originating in connection with pregnancy.

Another influence which I am disposed to recognize as an occasional predisposing cause is that of a *long-continued local irritation*, especially if associated with mucous or purulent discharge. It will be remembered that Trousseau (*Clinical Medicine*, Syd. Soc. Ed., vol. v. p. 206) endeavours to connect the closely-analogous condition of *adenia* or *lymphatic anæmia* with some previous local irritation. In a considerable number of the cases of so-called progressive pernicious anæmia, chronic diarrhœa, dependent on follicular irritation of the intestines, is reported to have existed before the development of the disease. In the first case here reported, an obstinate bronchial catarrh of five months' duration preceded the appearance of the characteristic symptoms. In the third case, chronic suppuration of the gall-bladder, with chronic follicular catarrh of the intestines, had ex-

[1] Revue Médicale, 1851, p. 553, *et al.*

isted for many years. It is evident that this latter cause might operate by interfering with the proper absorption of alimentary matters, and thus gradually undermining nutrition until some grave lesion of a part of the blood-making apparatus was superinduced. There are, however, other cases where no such cause can be assigned, and where the only influence that can be suggested as a possible cause is either overstrain of mind and body, or unfavourable hygienic conditions.

It seems, too, that in some instances chronic syphilis, and possibly chronic malaria also, may so profoundly affect the blood-making tissues as to develop fatal progressive anæmia.

And finally, cases have been met with where no cause whatever could be assigned, and the disease would appear to have originated idiopathically.

The *course* of the disease has been unusually similar in the majority of recorded cases, and in most respects the graphic description of Addison (p. 316) might still serve. Sometimes there is an indefinite period of slight failing in health before any change in appearance is observed; in other cases the patient complains of a gradual and increasing pallor, with loss of strength. More rarely the patient can refer to some particular week or day as marking a more abrupt beginning of his sickness.

The *appearance* of the patient soon becomes characteristic of extreme anæmia. In a small proportion of cases, jaundice of quite marked intensity may occur (Corrazza's Case, and Case II., here reported), and then subsequently the skin may retain a faint straw-coloured tint. But generally the surface is deathly pale, with or without a faint tinge of sallowness, the conjunctivæ pearly white, and, towards the latter stage of the disease, the bloodless pallor of the skin and mucous membranes is greater than I have ever seen it in other conditions, and the appearance of the patient becomes frightfully corpse-like. No abnormal pigmentation occurs.

*Dropsy* is a very frequent symptom, both as œdema and in the form of internal serous effusions. The œdema may be slight and transient, as in Case II. and III., or it may be persistent; in the latter form it usually comes on late in the case. In Case I., after having been limited to the face and ankles, it rapidly increased and spread over the whole body shortly before death. In Case II. it was limited to puffiness under the eyes, such as is so often seen in latent renal disease. It is evidently due to the watery condition of the blood, aided by the feeble state of the circulation. Internal effusions are frequent, but occur late, and are rarely of sufficient extent to attract notice by any special symptoms during life.

*Emaciation* does not occur to any marked extent. Addison laid especial stress upon the maintenance of the bulk of the frame, despite the utter exhaustion; and although in many cases a moderate amount of loss of flesh occurs, it is not to be compared with the emaciation which attends many exhausting diseases.

The *nervous symptoms* which are present are to be attributed chiefly to

the deficiency of blood and the weakness of the circulation. At first there is merely a sense of languor and indisposition to exertion; later the patient complains of giddiness and faintness, even upon sitting up; the mind grows dull, or can be fixed upon any subject but for a short time; somnolence increases with or without occasional wandering delirium, and as death approaches there may be deepening coma, or delirium may still persist. The patient also complains of the most intense feeling of muscular weakness, and this is frequently the only symptom that will be referred to by him. In my own last case this sense of prostration was so profound that the patient continually believed that he was about to die; and so terrible was it on awakening from sound sleep, that he insisted upon being disturbed every half hour. This is clearly suggestive of the anæmic state of the nerve-centres. Biermer noticed in some of his cases that transient paralysis occurred, which he attributed, with apparent reason, to small hemorrhages into the brain-substance.

The *circulatory* disturbances, intimately connected as they are with the state of the blood, are very interesting. The pulse is accelerated, and is very readily affected by trifling effort or excitement. Early in the disease it may retain a fair volume, but later grows small; it is always weak, compressible, or even gaseous. In addition it may, as in Case III., be intermittent. The patient is subject, from an early period of the case, to spells of palpitation, which may occur without apparent cause, but are usually the result of slight excitement or of some exertion, such as going up stairs, or even rising in bed. A marked tendency to attacks of syncope is a nearly constant symptom, and so dangerous may these be, as in Case III., that it is evident that any considerable effort should be avoided lest sudden death may occur.

The heart's action is feeble, the impulse very weak, and the sounds, especially the first, are poorly developed. When to these characters are joined the acceleration of action, the tendency to palpitation, the occasional irregularity or intermission, and the character of the pulse, it will be seen that the physical signs of marked fatty degeneration are distinctly present. Added to these are unusually strong hæmic blowing murmurs. In some cases these are limited to the region of the heart, aorta, and pulmonary artery, where they may be soft, or so loud and strong as to raise suspicion of the presence of organic disease. In other cases, as in Case I., there is associated with the hæmic cardiac murmurs, a well-marked anæmic hum (*bruit du diable*) in the large veins, especially the jugulars. I would allude particularly to the subjective roaring heard by the patient herself in that case, and to the fact that a distinct continuous humming murmur, uninfluenced by respiration, was audible on auscultation over the whole skull, and especially over the course of the lateral and longitudinal sinuses. In one of Gusserow's cases venous pulsation in the neck was observed.

The tendency to *hemorrhage* varies much in different cases. Thus in Case II. no hemorrhage occurred during life, and at the autopsy ecchymoses were found only on the visceral layer of pericardium. In Case III., the only hemorrhage noticed during life were numerous small petechiæ on the last day, and subsequently ecchymoses were found only under the mucous membrane of the stomach. In Case I., on the other hand, there was repeated hemorrhage from the gums, and menstruation was excessive. In many of the cases recorded abroad, petechiæ occurred—under the skin or in the retina—and occasionally hemorrhage took place from the nose or kidneys, or into the brain. No ophthalmoscopic examination was made in any of the cases here reported. It is possible that the coma which appeared before death in Case I. may have been due to cerebral hemorrhage. On the whole, hemorrhage in some form is a frequent and characteristic, though by no means constant, symptom; it occurs in many different forms, usually towards the close of the case, and in connection with internal organs is very frequently found among the post-mortem lesions.

In no case which presents the above symptoms, should we omit to make a most careful examination of the *state of the blood*. It is evident from a glance at the patient that the mass of the blood is diminished to an extraordinary degree, and this is confirmed by post-mortem examination. (See pages 324 and 332). A drop of blood drawn by pricking the finger seems thin and of a light dirty-red colour. Microscopic examination shows that the white corpuscles have undergone no increase whatever, though owing to the great diminution in the red globules, their relative proportion may seem somewhat increased. No peculiar change in the white corpuscles has yet been observed. The most striking change, however, is in the red globules. I do not know of any careful analysis to show how far their proportion is reduced, but it seemed to me I had never looked at a microscopic field of blood where the diminution in red globules even approached what was observed in Case III. No rouleaux were found, and the globules seemed paler and less biconcave than normal.

The *respiration* is naturally much disturbed, although no pulmonary lesion is present. With the attacks of palpitation above described, there is paroxysmal dyspnœa, and after the disease is fully established the breathing is very readily disturbed by slight exertion. Still later, when the anæmia is far advanced, I have noticed a peculiar persistent sense of insufficient aeration, which was so intense in Case III. that the patient insisted upon all the doors and windows of his bed-chamber being open, though the draft which was caused was so cold and strong that his nurses had to wrap themselves in fur robes during the night-watches. There is usually no cough, though in the latter stage of the affection, owing to the development of œdema and congestion of the lower lobes of the lungs, the breathing is apt to be quickened, and dry cough may appear. Physical examination in no case revealed any abnormal sign, excepting ex-

aggerated pulmonary resonance, owing to excessive anæmia of the lung tissue; until towards the close of the case, when congestion of the lower lobes appeared, with feeble vesicular murmur and subcrepitant râle.

The *digestive* system affords symptoms which are quite constant though not characteristic. I have already alluded to the fact that in a considerable proportion of cases the patient has previously suffered from chronic diarrhœa; but whether this has been so or not, there is apt to be occasional diarrhœa during the course of the disease, and especially towards its close. In some cases, on the other hand, the bowels are quiet throughout. I am not aware that hemorrhage from the bowels has yet been observed, though it may be expected to occur in some cases. The tongue is extremely pale; it may remain clear and moist, or, again, may present, as in Case III., a heavy whitish or yellowish fur. The appetite fails, and there may be entire anorexia; in some cases there is actual loathing for certain kinds of food, as greasy substances. There is usually a feeling of weight or pressure at the epigastrium, which is increased by food. Nausea is easily excited; in my own cases slight exertion was sufficient to produce it, and even to cause retching and vomiting. The abdomen is entirely indolent, is apt to be rather large and distended from the presence of flatus, and towards the close of the case often presents a moderate amount of peritoneal effusion (ascites).

The *liver* does not appear to be specially affected. In Case III. there had been attacks of hepatic colic for years previously, but the symptoms of the intense anæmia which developed itself later were not modified by hepatic disturbance. The jaundice which occasionally occurs, as in Case II., is transient and does not seem to depend upon any organic change in the liver, but to be due either to catarrhal inflammation of the ducts, or, as appears more probable to me, to the acute alteration of the blood. It will be noticed that both in Corrazza's case and my own the jaundice occurred early in the case, and upon its subsidence the evidences of intense anæmia were manifest. Throughout the disease (even in Case II., where the jaundice was most marked) the stools were well coloured.

The *spleen* is almost always enlarged, though but so moderately that it is frequently impossible to demonstrate the fact by percussion or palpation during life. The characters of the organ will be described further on, when speaking of the morbid anatomy of the disease.

The *lymphatic glands* are not at all enlarged.

The *urine* is, as a rule, normal in quantity and quality. In a few cases a small amount of albumen has been detected, though without the presence of tube-casts. In none of the three cases I have reported was albuminuria present, with the exception of the urine passed in Case III., soon after the second transfusion, which contained a large amount of albumen with hyaline and granular epithelial tube-casts. Although there was marked fatty degeneration of the kidneys, however, it is evident that this

was to be attributed to the effects of the transfusion, as the urine had been repeatedly examined previously without detecting any albumen. In a few of the cases reported abroad, hemorrhage from the kidneys is stated to have occurred.

There is no reason to suspect the *pancreas* of being implicated. In two of my cases careful examination of the stools failed to show any excess of free oil.

It remains only to notice the fact that throughout the course of this affection there is a tendency to *febrile action of irregular type*. In some cases this occurs in rather a paroxysmal way, the temperature being almost normal for a time, and then quite decided febrile exacerbation manifesting itself, and again subsiding after a few days. In other cases there is more continuous though still very irregular febrile movement. The elevation of temperature usually shows itself towards evening, as in hectic fever; and at times, as in Case I., the periodicity is so well marked as to arouse suspicions of the malarial nature of the case. The usual range of temperature is from the normal point to 101° or 102°; but it is recorded in some cases as high as 103° and 104°. In the table appended to Case III., it will be seen that the temperature, which, before the first transfusion, was slightly elevated, 101°, immediately afterwards rose to 104¼°, then rapidly fell again, and remained about normal for a few days, when a fresh rise began, the temperature reaching 103⅔°, and falling again during the night. Even before the second transfusion it was again rising, but under the effects of that operation it rose with frightful rapidity in twelve hours to 106°, when death occurred. Although this tendency to irregular febrile action is an important symptom, it cannot be spoken of as constant, and in some cases it is probable that the disease may run its entire course without any positive elevation of temperature.

Having thus alluded to the most important symptoms, a brief allusion must be made to the *morbid anatomy*.

The most remarkable changes are those connected with the *blood*. In the first place, the entire mass of the circulatory fluid is reduced to a greater degree than I have ever before witnessed, so that not only are all the tissues remarkably bloodless, but even the veins appear almost empty. In both of the examinations I have made, it is no exaggeration to state that after the escape of a small amount of blood from the portal vein, the remaining abdominal veins were literally empty. The characters of the blood have greatly changed. There are soft, dark coagula in the cavities of the heart, but elsewhere the blood shows little tendency to coagulate. Its colour is a dingy, dirty red (like thin coffee—Gusserow); it is very thin and watery, and is prone to undergo decomposition. I have already alluded to the microscopic appearances, and will merely add that in Case III., although it is probable that these appearances were in part due to the fatal effects of the second transfusion, the blood presented a truly

remarkable condition of the red globules, which were so pale and indistinct, as if from solution in the serum, that it was only by delicate focussing and the use of high powers ($\frac{1}{10}$ objective, Tolles) that they could even be detected as faint, shadowy outlines.

*Nervous System.*—The only constant appearance here is that of extreme anæmia of the membranes and substance of the brain. There may also be the traces of minute hemorrhages into the cerebral tissue. Frequently there is a rather unusual amount of clear serous effusion at the base. I am not aware that any microscopic examination has been made, excepting that by Mr. Quekett of the sympathetic ganglia, which are reported by Addison to have been fatty.

*Circulatory System.*—Next to the changes in the blood, the most constant lesion hitherto found is fatty degeneration of the muscular tissue of the heart. This may involve the entire substance of the heart, leading to loss of striation of the muscular fibres, and accumulation of fatty granules and minute oil-drops within the myolemma; or, as in many of Biermer's cases, it may be only partial and localized, affecting especially the papillary muscles. In both cases where I have had the opportunity of examining the heart, the fatty degeneration was general and far advanced. There can be no doubt in referring this lesion to the effect of the primary blood change. The valves of the heart are healthy. There are perhaps a few small spots of atheroma of the aorta, but there is no organic change to explain the fatty degeneration of the heart, which must be a part of the general malnutrition, as most clearly pointed out by Ponfick, in his memoir on the "Anæmic form of Fatty Degeneration of the Heart," already referred to. This is further confirmed by the experiments of Perl, which show that anæmia, caused by repeated large losses of blood, induces fatty degeneration of the heart.

The whole organ is flabby and relaxed, so that it does not retain its shape when thrown on a flat surface. Its size is not specially affected. The cavities, especially the auricles, contain soft dark clots. The lining membrane is in some cases stained by imbibition. Occasionally small ecchymoses are observed under the pericardium, and usually there is a small amount of serous effusion in the pericardial sac. In Case III. this effusion was of the colour of claret and water, and contained a few red globules, though its colour was chiefly derived from the dissolved hæmoglobulin.

In some cases, fatty degeneration of the small vessels in various organs has been found.

The *lungs* are extremely anæmic, pale, and crepitant, excepting at the postero-inferior portions, where there is nearly always marked œdematous congestion. There may be small ecchymoses on the pleural surface, and usually there is a moderate amount of serous effusion (f℥iv to f℥x), yellowish or more frequently reddish in colour.

The *mucous membrane of the stomach* may present small ecchymotic

patches, but is otherwise normal. Ponfick has observed fatty degeneration of the epithelium of the secreting glands. The intestines more frequently present lesions, especially in those cases in which there has previously been diarrhœa, when there is found marked enlargement of the solitary follicles of the small intestines, with or without thinning and softening of the mucous membrane. Even in such cases, the mesenteric glands appear to be but slightly, if at all, enlarged. In cases where no diarrhœa has been present, the intestines are healthy, excepting extreme anæmia of their walls.

The *liver* is not enlarged; its tissue is highly anæmic, and usually presents fatty degeneration. This may either affect the glandular cells uniformly throughout the organ, when the entire surface of a section is not only anæmic and pale, but decidedly yellowish; or, as in Cases II. and III., it may appear chiefly in irregular patches; or finally, as described by Gusserow, it may be observed as minute pale yellowish specks in the tissue. As would naturally be expected, where a lesion is of a purely secondary character and is determined by the general anæmia, its degree varies greatly in different cases.

The *spleen* is almost always slightly enlarged. In the descriptions of this disease will be found the statement repeatedly that enlargement of the spleen is not present. In reality, however, although there is no characteristic lesion, such as leukæmic changes or enlargement of the Malpighian corpuscles, there is in nearly every instance a slight but positive degree of enlargement of the spleen, which in different cases varies from $\frac{1}{4}$ to $\frac{1}{2}$ the original size. In addition to this the pulp has evidently undergone greater change than the other solid organs: it is softened and changed in colour, being purplish or dark brownish-red. It somewhat resembles the swelling of the spleen which follows section of the splenic nerves. And certainly, in an affection such as the one we are discussing, the smallest changes in any of the tissues undoubtedly connected with the elaboration of the blood are highly important.

The *kidneys* frequently present fatty degeneration of their epithelium. This was detected in marked degree in both my own examinations, associated in Case III. with obstruction of many tubules with fatty epithelial cells or granular matter. The capsules of the glands are healthy; the tissue intensely anæmic; there is no increase in connective tissue found; and everything points here, as elsewhere, to the entire dependence of the fatty degeneration upon the primary alteration of the blood.

The *supra-renal capsules* present no special lesion. There is no affection whatever of the *lymphatic glands*.

The peritoneal cavity frequently contains a small quantity of effusion, which may be so great as to attract attention during life.

I am not aware that the *marrow of the bones* has been carefully examined in any case of this peculiar form of anæmia, until the very thorough

study which was made by Prof. Tyson and myself of the specimens from Case III. In one case, graphically described by Ponfick,[1] which seems to have been of this nature, the general character of the marrow is described as "pale, clear grayish-red, quite soft, and of uniform appearance;" but no allusion is made to any more minute examination. I will not waste space by repeating the results given in connection with the case (p. 332), but will merely recall the fact that there existed extreme hyperplasia of the marrow, with production of lymphoid cells, constituting a change similar to that described by Neumann, Ponfick, Mosler, and others, as found in some cases of leukæmia. It is needless to say that it would be premature to advance any theory upon the conditions found in a single case, but if it be shown that in "idiopathic" or "progressive pernicious anæmia" the lesion of the medulla be a constant one, it will establish the truth of the view I now hold, that it is merely the simple medullary form of pseudo-leukæmia.

*Diagnosis. Relations to Pseudo-leukæmia.*—The recent authors who have described this form of anæmia, assert that it is to be distinguished from pseudo-leukæmia by the absence of enlargement of the glands or of the spleen; but it seems to me more rational first to briefly consider the points of resemblance between the two affections, and then to note the diagnostic symptoms, if any, that may exist. It is not necessary to do more than allude to the following features which both possess in common:—

The insidious and apparently causeless development of languor, debility, and pallor of the surface.

The tendency to palpitation of the heart, to attacks of dyspnœa, to giddiness, tinnitus, and later to dangerous and even fatal syncope.

The failure of appetite, sense of pressure at the epigastrium, and liability to nausea or vomiting on exertion or from indigestion.

The tendency to œdema and passive internal effusions.

The existence of strong anæmic murmurs over the heart and great vessels.

The occurrence of hemorrhages, as petechiæ under the skin or in the retinæ; or from the nose, gums, etc.

The occasional occurrence of albuminuria.

The progressive reduction of the mass of the blood, and especially of the proportion of red globules.

The occurrence of irregular febrile action in many cases.

The absence of emaciation in any marked degree.

The steady progress of debility; the occurrence of wandering delirium, or increasing coma, and finally death, despite all modes of treatment.

The frequent existence of fatty degeneration of the heart, kidneys, and liver, without other organic disease.

If to these important symptoms there be superadded progressive enlarge-

[1] Ueber Fettherz, p. 10.

ment either of the lymphatic glands or of the spleen, or of both, I think it will be admitted that we have presented the full clinical picture of pseudo-leukæmia. In such cases there may be some additional symptoms depending upon the special organ affected. Thus in cases marked by great enlargement of the glands, we may have pressure upon the trachea, causing dyspnœa and aphonia; upon the intra-thoracic vessels, causing large hydrothorax; upon the nerves of the lumbar or sacral plexus, causing paroxysmal radiating pains; or upon the great vessels of the abdomen, leading to unusually great œdema of the limbs or ascites. So, too, in cases where the spleen is especially implicated, special symptoms, such as ascites, hemorrhage from the stomach or bowels, may be prominent. But it would seem clear that such accidental symptoms cannot affect the fundamental and essential similarity between what I believe to be merely different forms of pseudo-leukæmia, as shown above.

If this be true then, and we have an affection characterized by a profound alteration in *hæmatosis* or the blood-producing function, depending upon lesions in the spleen, lymphatic glands, or marrow of the bones, and leading to the changes in the blood and the peculiar general symptoms we have dwelt upon, it is but right that it should be recognized as a special disease, and receive a name descriptive of its real character. The name of pseudo-leukæmia must certainly be abandoned as unmeaning and confusing. The word cachexia is not sufficiently definite, even when joined with the term "splenic," "lymphatic," or "medullary," according to the tissue chiefly affected. I would, therefore, suggest that, as the essential feature of this whole class of affections is the *defective elaboration of blood*, the term Anæmatosis (α, privative, and αἱματοσις, formation of blood) be adopted as a generic name, as distinguished from anæmia, where, without lesions of the blood-making tissues, the mass of the blood or its solid ingredients are diminished.

*Relations to Leukæmia or Leucocythæmia.*—It is impossible at present to enter upon a discussion of the clinical symptoms presented by leukæmia, and I must limit myself to the assertion, which can be supported, that the only symptom by which cases of the so-called pseudo-leukæmia can be distinguished from the corresponding forms of leukæmia is the increased proportion of white corpuscles found in the blood in the latter affection. In every other respect, as already recognized by Wood, Immermann, and others, their symptoms are indistinguishable. It is clear, also, that in leukæmia the characteristic symptoms and the fatal results are not dependent upon the excess of white corpuscles, but rather upon the profound impairment of the vital properties of the blood and the diminution in the red globules which coexist. Indeed, while these latter changes are constant and progressive, the increase in the white corpuscles appears at irregular and variable periods in the development of the disease, and varies immensely in its degree in different cases. At present it is impossible to decide upon the

exact lesion which determines this increase. We now know that hyperplasia of the marrow, of the spleen, or of the lymphatic glands, even with the development of lymphoid tissue in the liver, may occur and induce profound anæmatosis, but without any leukæmia. It would seem, then, that the changes in the splenic pulp and in the marrow are probably connected with the increased destruction of the red globules. But our knowledge of physiology is not yet sufficiently accurate to enable us to determine why, in certain cases, there is also an increase in the number of white corpuscles: whether there is, in such instances, an increased formation of them connected with hyperplasia of the Malpighian bodies of the spleen, or whether there is some peculiarity in the properties of the white corpuscles in those cases which prevents their conversion into red globules, and thus causes them to accumulate. It is not desirable to speculate about this point, which will probably be soon settled; but the very important conclusion is that a condition so inconstant and irregular, as the increase in the proportion of white corpuscles, should not be made a ground of distinction between groups of cases identical in all other respects. It would certainly be more reasonable to regard all such cases as forming one great class, and to accept such conditions as increase in the white corpuscles as indicating some peculiarity in certain individual cases of the class. Thus, instead of adopting leukæmia as the type, and speaking of pseudo-leukæmia, I would propose to group all of these cases, distinguished by progressive deterioration of the blood connected with lesion of some part of the blood-making apparatus, under the name above suggested of *anæmatosis*, and, if it be deemed necessary, to distinguish those cases which present increase of white corpuscles in addition to the other symptoms by the prefix "*leucocytic*."

*Albuminuria.*—There is no doubt that some cases of albuminuria bear a close resemblance to the form of anæmatosis we have been considering. But when the small and inconstant amount of albumen in the latter affection is remembered, as well as the absence of tube-casts, the presence of anæmic murmurs without any hypertrophy of the heart, and the more intense degree of the blood alteration, it will not be difficult to avoid the error of confounding them.

*Addison's Disease.*—This rare form of anæmia, with bronzing of the skin, which Addison first pointed out as connected with a peculiar form of disease (chronic scrofulous inflammation) of the supra-renal capsules, can scarcely be distinguished from the other forms of anæmatosis until distinct bronzing of the surface makes its appearance. In fact it is difficult to avoid the conviction that there is more than a mere superficial resemblance between the two affections, and that an analogous disturbance of hæmatosis (possibly connected with lesion of the marrow of the bones) is the essential feature in Addison's disease.

*Prognosis.*—Unfortunately there is but little to be said upon this point, since in every case where the specific characters of the disease have been

well established, the symptoms have steadily progressed to a fatal result. In the cases of the purely medullary form—where neither spleen nor lymphatic glands are enlarged—it is manifestly difficult to fix the moment when the case is recognized as differing from ordinary severe anæmia. When, however, such an anæmia has appeared causelessly, and progresses despite the use of full doses of iron, suitable food, and favourable hygienic influences, with the peculiar group of general symptoms, and especially with those indicative of fatty degeneration of the heart, there is grave reason for fearing that we have to do with an organic anæmatosis, and that death will result.

*Treatment.*—From what has been already said, it will be understood that treatment offers little ground for hope in this affection.

In the early stages, rest and change of residence should be recommended. Bearing in mind that not rarely fatty degeneration of the liver and glands of the stomach is present, and that consequently digestion is much impaired, the nutrition should be most carefully attended to, and food administered in the most digestible forms.

Owing to the failure of the appetite and the muscular debility, there would seem to be an indication for the use of tonics, such as vegetable bitters or the mineral acids. But there is no evidence to show that they are productive even of temporary—certainly not of permanent benefit. The same must be said of quinia, which is apt to fail to arrest the irregular febrile movement or to modify the progress of the case, even if the condition of the stomach will permit its continued use in full doses. Notwithstanding this, however, I should certainly recommend the persistent use of quinia for its general tonic action, associated with digitalis, on account of the feebleness of the heart.

*Iron* would naturally suggest itself as the most appropriate remedy in view of the intense and progressive anæmia. It is found, however, that in some cases it is not well borne, and that, even when given in large doses, it exercises no curative effect. The entire failure of the preparations of iron must be regarded as one of the marked features of difference between this form of anæmia and chlorosis. It is not difficult to explain their want of action, however, when we reflect that the cause of anæmia here is an organic lesion of some of the tissues concerned in the elaboration or in the disintegration of the corpuscular elements of the blood.

In view of the changes which seem to lie at the bottom of these obscure diseases, it would appear that the same powerful alterative medicines which we employ in other cachectic conditions should be relied upon here, and that cod-liver oil, iodine, and arsenic, or some of their preparations, should form a part of our treatment. In the paper of Mr. Broadbent (*Practitioner*, January, 1875), already referred to, the use of *phosphorus* is recommended, on account of its well-known power of influencing profoundly the processes of hæmatosis and nutrition.

*Transfusion.*—There is, however, one important remedial measure which would undoubtedly suggest itself to every mind. In view of the great reduction in the mass of the blood, and especially in the proportion of red globules, the performance of transfusion would seem strongly indicated. And accordingly in several of the reported cases we find that this operation was either suggested or actually performed. Attractive and promising, however, as it seems at first sight, there does not appear to be any substantial reason for expecting more than temporary benefit from transfusion in such a condition. If the diminished amount of blood constituted the essence of the disease, recovery might be effected by adding fresh and healthy blood. But, since this is but one symptom of a profound lesion of the blood-making apparatus, I can see no good reason for hoping that the morbid process can be arrested, or its effects counteracted merely by adding a small amount of healthy blood to the mass of altered and partly devitalized fluid in the patients' veins. It must further be remembered that the conditions here present must render it necessary to inject a very small quantity of blood at any one time. The heart is uniformly found in a state of fatty degeneration, there is extreme tendency to syncope, and the amount of circulating fluid is very small. It will be easily understood, therefore, that transfusion, to be safely practised in such conditions, must be very cautiously and slowly performed, and the amount of blood injected must be comparatively small. If these precautions be neglected, reasoning would lead us to expect, and experience has unfortunately confirmed the apprehension, that there may be dangerous or even fatal shock after the operation. In Case III. transfusion was twice performed. After the first operation, when only f℥ivss defibrinated blood were slowly injected, very alarming symptoms presented themselves in a few hours, and so violent was the depression as to threaten a fatal result. Following these dangerous symptoms, however, there was a short period of apparent improvement resulting from the effects of the transfusion. It was but short-lived, however, and it will be observed that for forty-eight hours preceding the second transfusion, the patient's condition was not so favourable; debility increased, and for the first time petechiæ made their appearance.

The second operation was performed even more slowly and carefully than the first (the amount introduced being but f℥vss), and yet it has been seen that the patient survived the operation only twelve hours—dying with greatly increased temperature, rapid pulse and breathing, and delirium followed by coma. This is not the place to discuss the cause of these terrible symptoms which follow some cases of transfusion. They are very frequently observed when the blood of any other animal than man is used for transfusing. But even in cases where human blood is used, it is unfortunately true that they may still occur. It has seemed to me that there is greater danger of such results when the operation is quickly performed,

the blood being introduced rapidly; when the amount of blood used is large, and especially when there is disease of the heart or lungs. Whether there may not be still further danger in such conditions as the one we are discussing, where the blood-making tissues are diseased, is a question to be answered by future experience. The results obtained by others, in the few cases of "progressive pernicious anæmia," where transfusion has been performed, are no more encouraging than those in my own case. It was performed in three of Gusserow's cases (loc. cit.). In one, between five and six fluidounces of defibrinated blood were injected without any immediate difficulty, but the patient died the following day in mild delirium. In another instance, the same quantity was introduced by direct transfusion, but with no better results, as the patient was seized with vomiting and chill, followed by high fever, and death ensued in about forty-eight hours. In one case only did temporary benefit follow the transfusion, by the direct method, of about five fluidounces of blood.

In the interesting case of Dr. Chadwick's already alluded to, the amount of blood transfused was unintentionally large, f℥xj, though, owing to an accident, a small hemorrhage of f℥iv or v subsequently occurred from the vein opened in the operation; but the symptoms which almost immediately followed the operation were precisely similar to those reported in my own case (see page 328), and resulted fatally on the following day.

It is therefore evident that in this form of cachexia, and in all others where similar conditions of fatty degeneration of the heart and greatly diminished mass of blood are present, the only way in which any benefit can be hoped for from transfusion, is by introducing very small quantities of blood at a time, and repeating the operation as frequently as may seem desirable. I would also suggest that the blood should be injected into one of the smaller superficial arteries, so as to diminish the risk of serious disturbance of the heart.

Although, however, up to the present time the operation has not been followed by encouraging results, and although we cannot hope for any radical or permanent benefit from its use, I am still disposed to recommend its performance, strictly in the manner indicated, for the purpose of prolonging life and enabling a better trial of internal remedies to be made. If, however, any alarming symptoms should follow the first small transfusion, it would be more prudent not to attempt a repetition of the operation.

It may be advisable, in concluding this discussion, to briefly state the conclusions which seem to be indicated.

1. Progressive pernicious anæmia is identical with the idiopathic anæmia of Addison, and is in no sense a new disease.

2. It is in reality the medullary form of so-called pseudo-leukæmia.

3. As the primary and essential lesion in this and the analogous conditions (leukæmia and pseudo-leukæmia) appears to be an affection of the

chief blood-making tissues—spleen, lymphatic glands, marrow of the bones—causing defective elaboration of the blood, it seems proper to select some name that will indicate this fact, as *anæmatosis*.

4. The changes in the blood consist of great reduction in its mass, with extreme diminution in the proportion of red globules, without increase in the white corpuscles. There are probably also changes in the vital properties both of the red and white corpuscles.

5. The other lesions, chiefly fatty degeneration of the heart and other organs, passive effusions and hemorrhages, are secondary, and depend upon the blood changes.

6. The symptoms are explicable, in great part, by the state of the blood and the condition of the heart.

7. The disease, when once fully established, appears to be invariably fatal.

8. The remedies which afford most prospect of relief are cod-liver oil, arsenic, and phosphorus.

9. Transfusion is only capable of doing temporary good.

10. The operation is not free from grave danger, owing to the feebleness of the heart and the small amount of blood in the vessels; and, in order to be safely employed, the amount of blood injected must be very small (f℥iij), it must be introduced very slowly, and the operation must be repeated at suitable intervals. It adds to the safety of the operation to inject the blood into a small artery instead of a vein.

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## ART. II.—*Angina Pectoris.* By HAMILTON OSGOOD, M.D., of Philadelphia.

IN looking through the literature of this agonizing disorder, one is struck by the great, indeed confusing, variety of opinions which have been put forth concerning its cause and nature. Its terminology is not less embarrassing. The disease was first described by Heberden in 1768. He gave it the name of "angina pectoris." Since his day various authors have affixed to this lesion names which express, to a greater or less degree, the opinion of each writer as to its etiology and pathology.

Thus, we have "sternalgia" (Good); "syncope anginosa" (Parry); "stenocardia" (Brera); "strernodynia syncopalis" (Sluis); "neuralgia cardiaca and hyperæsthesia plexus cardiaci" (Romberg); "hypercinesis with hyperæsthesia" (Bamberger); Bouillaud terms the affection "neuralgia of the phrenic nerve," and finally we find the common German term

"Brustbraüne," literally "breast quinsy," a poor substitute for better names.

These terms are descriptive and for the most part unsatisfactory. The disease has no common name, although, in English and French works, "angina pectoris," which is too diffuse, is the term commonly used. The Germans generally prefer "stenocardia," which, while it localizes the disease and is undoubtedly a better descriptive title than angina pectoris, does not cover the probable nature of the lesion so fully as the "cardiac neuralgia" of Romberg; which term upon the whole appears to me to be the most intelligent and satisfactory. But, if one were to use this term, he would at once be requested to explain himself, which he would do by substituting the term angina pectoris; which name, while it answers every purpose so far as the sensations of the patient are concerned, neither strictly locates, nor in any way suggests the nature of the complaint. Even the term cardiac neuralgia (which may be understood as including a derangement of the cardiac plexus) becomes poverty stricken when we ask how it happens that during an attack of neuralgia of the heart, the fourth finger and ulnar side of the ring finger of the left hand become numb, cold, and painful. Why not the whole hand, when the whole left arm aches? And, if these symptoms indicate that only the ulnar nerve is engaged, who can explain why it is that other nerves coming down the arm from the brachial plexus are not also affected? That nerves of another sort are involved, is shown by a symptom which I do not find mentioned in any article on angina pectoris to which I have had access, but which came to my notice in the first case of this lesion I ever saw in my own practice, and which I had abundant opportunity to study during the six months of its intermitting attacks. The symptom to which I refer is a decided difference between the radial pulses; a difference which makes them so entirely dissimilar, that, while the right pulse is comparatively full and strong, the left is almost or quite imperceptible. This symptom suggests that, in the affection under consideration, the vaso-motor nerves of the left arm are also subjected to the same influence which affects the ulnar nerve. How does this curious selective influence do its work? If by the route of the spinal cord, as some suggest, why is the left arm alone affected? Why not the right? It is but very rarely that this arm is involved in the attack. And, even in the left arm; since the median nerve receives half its fibres from the inner cord of the brachial plexus, whence also arises the ulnar, why is the latter nerve subjected to effects which, save in rare cases, spare the median? And if the pain sometimes involves the median, why not always? By what process can pain, extending from the cardiac to the brachial plexus, travel over this plexus, run down the inner cord, and be so accurately, and almost invariably, switched off upon the ulnar nerve alone? The fact, too, that the vaso-motor nerves of the left arm are also engaged, increases the general cloudi-

ness of the subject. "As in many other neuralgic affections, so in this, too, is found much that is inexplainable." (Von Dusch.[1])

The singular partiality for certain widely deviating paths, which is[2] exhibited by the pain of angina pectoris, is well shown by Von Dusch:—

"The neuralgia which arises in the cardiac plexus, radiates over the track of the vagus and sympathetic to the cervical and brachial plexuses, with which these nerves are so intimately united. The pain also involves the major and minor occipital nerves (which arise from the first and from the posterior branch of the second cervical nerves respectively), as well as the supra-clavicular nerves which supply the integument of the upper chest as low down as the fourth rib. The anterior thoracic nerves mentioned by Lussana, and which arise from the brachial plexus, are purely motor; and yet, it is over the internal cutaneous nerves on the inner side of the upper arm, and over the ulnar on the posterior and outer side of the forearm, down to the integument of the fourth and fifth fingers, and in rare cases over the terminal branches of the median in the remaining fingers, that the pain radiates; and these nerves arise from the same plexus as the anterior thoracic. Through the cervical plexus the phrenic nerve is also brought into sympathy, and hence arises singultus; while the œsophageal symptoms (suffocation, difficulty in swallowing, and globus), and the gastric symptom (vomiting), indicate the participation of the pneumogastric filaments."

It is these eccentric routes of the pain which mystify Von Dusch and many another physiologist.

Romberg[3] theorizes as follows:—

"So far as the rootlets of the sensitive fibres of the cardiac tissue are concerned, the seat of sympathetic pain is of physiological interest. Müller has already called attention to the fact that the prevertebral cord of the sympathetic is only an *apparent* connective between the upper cervical and the coccygeal ganglia, and that the root-fibres from the spinal cord, after they have entered the prevertebral cord, run only for a certain distance in the same, and then, leaving the cord, lose themselves in the peripheries of the organs, etc. Consequently, sympathetic fibres which emerge from the prevertebral cord are neighbours of cerebro-spinal nerves which supply the upper portion of the trunk. Hence, when pain radiates from organs either of the abdomen or thorax, the sensation necessarily appears in the upper extremities, in the neck, and still higher, in the head. (Henle.) The radiation of cardiac neuralgia, then, allows us to suppose the anatomical contiguity, in the spinal cord, of the sensitive cardiac fibres of the sympathetic and of the sensitive elements of the cervical nerves. That a similar group of symptoms also makes its appearance in primary affections of the cervical district of the spinal cord, cannot be surprising. This was quite overlooked by observers, who, following in the footsteps of Parry and Jenner, suppose that cardiac neuralgia, or, as Heberden first entitled it, angina pectoris, has merely a peripheral origin, and connect the symptoms with a definite organic change, viz., incrustation of the coronary arteries. Others claim that this neuralgia may find its cause in a great variety of morbid conditions of the heart; but with what misjudgment is proven by more recent observers. Whoever doubts this may find enlightenment in Laennec's experience."

This suggests the widely divergent opinions as to the etiology and pathology of angina pectoris. But, while there exists this opposition of opinion as to cause, there seems to be among physicians a general belief that angina pectoris *invariably* includes organic disease of the heart. I

[1] Lehrbuch der Herzkrankheiten. [2] Op. cit. pp. 336.
[3] Nervekrankheiten, s. 145.

think this belief an error. It may be that those who thus believe, class that form of angina pectoris, in which the heart is apparently sound, under the head of "pseudo" or "simulating" angina. For example, Flint, in the earlier editions of his work on "Diseases of the Heart," described a form of angina pectoris which he termed "pseudo"; but in later editions he omits the term "pseudo" and speaks of angina pectoris *with* and *without* disease of the heart. This modification, so far as it goes, I am convinced is correct. There can be no such affection as *pseudo* angina pectoris, even though the attack may have an hysterical basis, for, in the hysterical cases in which I have met with angina pectoris, the symptoms, varying of course in their severity, invariably included the prominent landmarks of the disease. They were too real in their effects to admit of being considered simulative; and since hysteria, as Romberg acknowledges, can run into real neuroses, angina pectoris may be considered one of them. If a seizure cause, for example, a very marked contraction of the radial artery, or severe pain in a locality so far removed from the heart as is the hand, these symptoms are significant of the real nature of the attack. But if in such case the heart were found to be normal, believers in the invariable connection of angina pectoris with organic disease of the heart would therein find their chief, indeed only, reason for considering the attack of pseudo nature and the cause hysteria. If there were no tangible effects this view might be admitted, but when, setting pain aside, symptoms so sharply marked as numbness, local loss of temperature, unsymmetrical contraction of arteries are observed, there certainly is neither voluntary nor involuntary simulation. But I feel impressed that the exact truth would carry us even further than this. When the attack seizes a person whose heart is sound, I believe the difficulty to be a functional derangement of some nerve or nerves which more or less directly influence the heart, and are capable from their connections of propagating pain elsewhere. As Von Dusch remarks, there must be an "especial cause," but what this cause is, and why the pain seeks such eccentric routes, seems unanswerable. On the other hand, if the spasm complicate some lesion of the heart, I am unable to see how it can be other than a *coincidence*, not dependent upon the cardiac affection. Otherwise, why is it that out of the multitude of cases of disease of the heart and vessels, there are so few which include angina pectoris?

It should be remarked that the pain in the left arm does not invariably extend to the fingers, for I have seen one case in which the numbness and neuralgia stopped at the elbow. But, even in this case, there was the contracted radial at the wrist, indicating that the vaso-motor nerves of the forearm were under the influence of the attack. It may be supposed that other arteries of this arm also become contracted, this condition contributing, perhaps, to the pain which, according to the statements of patients whose forearms were suffering, was not confined to the track of

the ulnar, but involved the whole member. Yet in these cases only the third and fourth fingers of the left hand were affected, thus suggesting that out of the motor nerves of the arm the pain had chosen only the ulnar.

Another point is, that, although the third and fourth fingers of the left hand have a lower temperature than other fingers of the same hand, the entire member has less warmth than the right. The same remark may be applied to the temperature of the whole left arm as compared with that of the right.

To return now to the different opinions of writers on angina pectoris as to the cause of the attacks. The passage from Laennec to which Romberg, as above mentioned, refers, is the following:—[1]

"The majority of physicians in England, Germany, and, above all, in Italy, are not the less convinced that angina pectoris is always connected with some organic disease of the heart, that the attacks are very serious, and that the greater number of patients who are attacked die suddenly. These ideas are far from being exact. Angina pectoris of moderate severity is an extremely common affection, and very often exists in individuals who have no organic disease whatever, either of the heart or of the great vessels. I have seen many individuals who have experienced only a few attacks of great severity, but of short duration, and who subsequently became entirely freed from them." And further: "On the contrary, it is true that angina pectoris is frequently coincident with organic affections of the heart, but even in such cases nothing proves that the angina is dependent upon the cardiac affection, for it can arise when the heart is normal. I have made *post-mortem* examinations of the bodies of subjects who were simultaneously subjected to hypertrophy and dilatation of the heart and angina pectoris. In not one instance did I find ossification of the coronary arteries. One of these patients died suddenly during a violent attack of angina pectoris. Any one will admit that the union of so intense a nervous affection with enormous hypertrophy of the heart (which existed in this case) might sometimes produce this result."

Laennec considered the disease a neuralgia, and says: "I believe that its seat may vary, or rather, that a neuralgia which originates in different nerves may give rise to the same symptoms." Hence he argues that the pneumogastric, or the cardiac portion of the sympathetic, may either of them be the point of origin, and that the brachial plexus becomes sympathetically implicated.

Heberden[2] thought that angina pectoris originates in cardiac cramp or spasm, and mentions the autopsy of a man who died suddenly of this disease. "A very skilful anatomist," says Heberden, "could discover no fault in the heart, in the valves, in the arteries or neighbouring veins, excepting some rudiments of ossification in the aorta."

Friedreich[3] divides the disease into *dynamic* and *organic*, and says: "The dynamic (idiopathic, functional, nervous) form arises without complication with any organic affection whatsoever. The organic form is united with organic change in the heart or large vessels." He believes

[1] Traité de l'Auscultation, 3d edition, pp. 350, 351.

[2] Heberden's Commentaries, pp. 296, 297.

[3] Herzkrankheiten, Virchow's Handbuch, v. Band.

angina pectoris to be a neuralgia of the cardiac plexus, that dynamic angina is a hyperæsthesia and primary neuralgia of this plexus, and that "organic angina pectoris depends upon calcification, obliteration, and degeneration of the coronary arteries." Bamberger[1] writes: "That the affection is neuralgic can be positively asserted. Whether the real point of origin is to be sought in the sympathetic, the spinal cord, or in the cardiac ganglia cannot be determined. The greatest probability, however, declares in favour of the latter, or, in a larger sense, in favour of the cardiac plexus." He believes the affection to be most frequently dependent upon some material disturbance of the heart, but adds:—

"One must protect himself from the one-sided view, that one particular anatomical condition of the heart is the cause of stenocardia. Hence the old view which makes calcification of the coronary arteries the cause of the lesion is certainly as incorrect as the more modern belief which exclusively accuses fatty metamorphosis and flaccidity of the heart." And finally: "One is inclined to assert that stenocardia is essentially grounded in a clonic spasm of the heart with hyperæsthesia, which condition, however, extremely seldom (perhaps never) depends upon a purely nervous disturbance, but as a rule is the result of a diseased condition of the heart through which an abnormal irritation acts upon the cardiac ganglia or cardiac plexus."

Canstatt,[2] deriving his conclusions from the autopsies of forty-five fatal cases of angina pectoris (gathered by Forbes), and of which only six were found free from affections of the heart or vessels, believes that "fatal cases of purely functional angina pectoris are rare;" and further says that—

"The common revelations of autopsies in fatal cases consist of striking changes in the cardiac structure or large vessels, especially the aorta." Mentioning a dozen varieties of these changes, he concludes thus: "None of these changes, which are often absent, and not less often present, without causing angina pectoris, contain the essential cause of the disease, although it must be admitted that they are reckoned as factors of the lesion."

According to Stokes—[3]

"It is greatly to be doubted that angina pectoris has ever occurred in a patient perfectly free from organic disease of the heart or aorta. In the present state of knowledge we must follow Dr. Latham in considering angina pectoris rather a special set of symptoms than a disease having a fixed anatomical character."

Latham believes the affection to be invariably connected with disease of the heart, and, as to its true character, says:—

"Now we are in search of something in the heart which, as a concomitant of pain, may be disabling to its natural functions and capable, according to degree, of hindering or abolishing them altogether. This we find in spasm. In its spasm of smaller degree the heart fails to close freely upon the blood and to impel it freely into the arteries. In its spasm of greater degree it fails to project it altogether. Hence we discern an adequate explanation of the chief phenomena of angina pectoris: it is spasm of the heart."

Stokes confesses that "it is difficult to understand how such a general or local spasm, bearing in mind that the heart is a hollow muscle, could

[1] Krankheiten des Herzens. [2] Pathologie u. Therapie, iii. Band, s. 88.
[3] Diseases of the Heart and Aorta, art. Angina Pectoris.

occur as would only impede and not destroy the heart's function; for a complete spasmodic closure of any one cavity ought to cause death by breaking the continuity of the circulation." In regard to this point Flint agrees with Stokes. According to Parry, whose views are also opposed to the doctrine of spasm, "the disease is an example of syncope, preceded by a notable anxiety or pain in the region of the heart, the result of organic lesion, which acts in diminishing the energy of the heart." And he holds that "the symptoms arise from retardation and accumulation of blood in the cavities of the organ." Hence Parry's name for the disease: "Syncope Anginosa."

Köhler[1] considers angina pectoris undoubtedly a neuralgia of the cardiac plexus, "complicated only in severe cases with cardiac spasm."

C. J. B. Williams[2] affirms that the disease "is commonly associated with organic lesions, especially, but not exclusively, those affecting the aorta and its valves; but," he adds, "such affections frequently exist without it. So, on the other hand, anginal or neuralgic pains sometimes occur in persons who have no organic disease; thus resembling other forms of nervous disorder, which, although occasionally excited by the irritation of bony deposits, or other permanent lesions, *may arise from an excessive sensibility developed by more transient causes.*"

Tanner[3] says: "It may be remarked that our improved means of observation have rendered it almost certain that this disease is always associated with some important organic affection."

Niemeyer[4] asserts that "angina pectoris is almost exclusively met with in individuals who are suffering from organic disease of the heart." Mentioning a variety of cardiac affections which were found in fatal cases of angina, he adds:—

"Nevertheless, angina pectoris is not to be considered as a special symptom of these anatomical changes, for none of them is constantly connected with it. It arises under the same form in the most opposed structural changes of the heart, has its paroxysms and free intervals. So that, in fact, we are obliged to consider it a nervous affection of the heart, to which by preference only organic diseases of the organ are disposed. In solitary cases, angina pectoris arises without organic cardiac lesion, especially in aged, fleshy subjects; in men oftener than in women."

Trousseau[5] wrote as follows:—

"All the incontestable histories of individuals who during life presented all the characteristic symptoms of angina pectoris, and yet, whose autopsies did not reveal the slightest anatomical change to which these symptoms could be attached, demonstrate that angina pectoris is not necessarily connected with organic diseases. From the absence of appreciable organic change and from the variability of the phenomena, we must conclude that the disease is a neurosis or more precisely a neuralgia. It ordinarily occupies the cardiac nerves which emanate from the pneumogastric, whence it radiates to the cervical and

[1] Therapie, i. Band, s. 484.
[2] Diseases of the Chest, pp. 232, 233.
[3] Practice of Med., p. 394.
[4] Pathologie u. Therapie, 8e Auflage, i. Band, s. 411.
[5] Clinique Medical, t. ii., pp. 529, etc.

brachial plexuses. With the majority of clinicians I admit that this singular neurosis may be symptomatic, but I admit it only in the sense that in such case there is a simple coincidence, and that, whatever they may be, organic affections merely afford an opportunity for the development of the nervous lesion which attaches itself to them."

Gerhard[1] believed that "angina pectoris depends upon a functional disease of the heart closely allied to gout, or upon various organic lesions, especially ossification of the valves."

Oppolzer[2] is undecided as to the etiology of the disease, but thinks that a certain connection exists between angina pectoris and heart disease. He refers to cases of so-called "reflex stenocardia," which were observed in coexistence with diseases of the uterus, kidneys, and liver, and mentions instances which were caused by catarrh of the stomach.

Da Costa[3] thinks it "more than highly probable that these so-called spasms of the heart are always linked to some structural change." Mentioning the variety of structural changes which may be coincident with angina pectoris, he concludes that "it is not impossible that combined with all these states is fatty degeneration, which thus would be at the root of the angina;" and that, "whether this view be correct or not, it is undoubted that fatty degeneration is more frequently conjoined with angina than in any other disease."

Flint's[4] opinion is that "fatty degeneration is sometimes observed, but by no means as a rule." He says further:—

"I will simply remark that the hypothesis which attributes the occurrence of angina pectoris to simple weakness of the heart, has no better foundation than that which attributes it to spasm. Angina pectoris is not always accompanied by evidence of lesions of the heart or aorta. There is reason to believe that it may be a purely nervous affection. Heretofore I have considered true angina as invariably incident to cardiac or aortic disease, considering all cases in which more or less of the symptomatic phenomena are manifested, without the signs of disease of the heart or aorta, as cases of simulated or pseudo-angina. I am satisfied that this doctrine is incorrect, inasmuch as the distinctive features of the affection may be as well marked without as with these signs."

He thinks the paroxysms involve, as a point of departure, neuralgia of the cardiac nerves, and that the disturbed action of the heart in certain cases is due to an affection of the pneumogastrics, but does not find this cardiac disturbance a constant element of the paroxysms. Referring to the Heberden theory of spasm, Flint says: "A spasmodic condition of the heart sufficient to occasion such prolonged as well as intense pain, would be incompatible with life."

Von Dusch[5] expresses his belief that the disease is a neuralgia of the cardiac plexus. He adopts two forms of cases, the "idiopathic or reflexive," which is not attended by changes in the cardiac structure, and the

[1] Diseases of the Chest, 4th ed., p. 427.
[2] Pathologie u. Therapie, s. 267.
[3] Medical Diagnosis.
[4] Diseases of the Heart, art. Ang. Pect.
[5] Op. cit.

"symptomatic," which he considers the most frequent, and which involves a complication of some disease of the heart.

Finally, he says: "If we follow the analogy of other paroxysms of pain, in the district of the sympathetic, *e. g.*, cases of intestinal colic, cardialgia, nephritic, and gall-stone colic, we must suppose the existence of a spastic condition of the heart, which causes the painful sensations," and he points to the small pulse as significant of this spasmodic condition of the organ.

Wolff[1] believes that the cause of angina pectoris lies neither in fatty heart nor atrophy of the organ through calcification of the coronary arteries, but finds the reason simply in an imperfect innervation of the heart.

Lancereaux finds the cause in an inflammation (neuritis) of the cardiac plexus, and cites *post-mortem* proof.

Eulenburg[2] and Guttman conclude from an analysis of cases, and from the experiments of Bezold, that abnormal action of the heart in angina pectoris is due to the influence of the sympathetic on the ganglia of the heart, and, as all the sympathetic fibres of the heart meet in the cardiac plexus, that this plexus is the medium through which the abnormal action is produced.

J. Lockhart Clarke (quoted by Knight, loc. cit.) thinks Laennec's view in regard to the proximate cause of the disease has been materially supported by recent inquiries.

Loupias[3] believes in an "essential and symptomatic" form of angina pectoris.

Moinet[4] strictly divides the disease into functional and organic. The first form he confines to young persons; finds it independent of heart disease, thinks it a neurosis due to lack of cardiac innervation, and curable. The organic form, he thinks, is due to a serious affection of the heart, which paralyzes the organ. The paroxysms of the organic form he cannot explain.

Nothnagel[5] thinks the "so-called angina pectoris" is in many cases due to a spasm of the arteries, and terms it "angina pectoris vasomotoria," deeming the cardiac spasm secondary to a wide-spread arterial spasm.

Bouillaud[6] thought angina pectoris a neuralgia of the phrenic nerve.

Handfield Jones thinks the disease a neuralgia.

Bellingham called it "dyspnœa of the heart."

Dickson[7] thought it a functional affection of the heart itself, being depen-

[1] Schmidt's Jahrbücher, 1866, ii. Band.

[2] Knight's Article on Ang. Pect. in Boston Med. and Surg. Journal for May 21, 1874.

[3] Schmidt's Jahrbücher, 1866, ii. Band.

[4] Schmidt's Jahrbücher, 1870, ii. Band.

[5] Schmidt's Jahrbücher, 1867, ii. Band.

[6] Maladies du Cœur.

[7] Elements of Medicine, p. 366.

dent neither upon a gouty diathesis nor upon disordered state of the stomach (as Butler, McQueen, and Chapman have taught), nor necessarily connected with organic disease of the heart; but admits the possibility of cardiac spasm.

A comparison of these conflicting views, which it were useless to classify, will indicate the confusion which exists among medical writers in relation to angina pectoris. The subject is still enveloped in a haze of uncertainty. Opinions are kaleidoscopic. Every writer has his own view. A search in books for satisfactory information as to the true nature of this neuralgia reminds one of the vexed subject of tubercle. But Laennec's opinions, amalgamated with Romberg's title for the disease, seem the most reliable. It will be noticed that the doctrine of the invariable connection of angina pectoris with heart disease meets with strong opposition, —opposition which is yearly gaining new disciples. That the paroxysms do not depend upon cardiac lesions has been proved to my satisfaction in four of the five cases which I have treated. In the fifth case I believe the attack to have been a coincidence and not a result of the condition of the heart.

CASE I. The first of these cases was that of a young lady who had suffered from hysterical neuralgia for several years. Two years ago, upon one occasion, I greeted her by taking her left hand, and was at once struck by the very great coldness of the little finger. Testing the sensibility of this finger, I found that it lacked ordinary sensation, likewise the ulnar side of the ring finger. Upon questioning the patient, I learned that the entire left arm was numb and somewhat painful, and that a heavy feeling existed about the heart. A few days subsequently the first attack of angina appeared.

Nothnagel might claim these prodromic symptoms as testimony to his theory of primary spasm of the arteries.

The first attack in this case was attended by instructive features. When I reached the patient, I found her unconscious, in a recumbent posture; face somewhat flushed; pulse 140; respiration laboured; left hand relatively cold. Arousing her with questions, she replied in a bewildered manner, invariably using the last word of my question, saying nothing more, and even that much with difficulty. Directing her attendants to remove her clothing, I saw her again after she was placed in bed. The case puzzled me. I gave her brandy. To my surprise the pulse fell within a few minutes from 140 to 90. This furnished the first leading clue as to the nature of the difficulty. Somewhat revived, the patient alternately grasped her left arm, and clasped her hand spasmodically over the heart. I then decided the case to be angina pectoris. Still more revived, patient, using signs, called for pencil and paper, and wrote: "I cannot speak, but feel better." A few minutes later when I questioned her, she pointed to her larynx and shook her head, still unable to speak (thus indicating the implication of the laryngeal nerves), but expression and gesture told me of the pain she was suffering. At intervals I administered tinct. op. in large doses, brandy and laudanum, ammonia and brandy, meanwhile applying mustard over the heart and bottles of hot water to hands and feet. The first attack passed by, but within an hour

came a second. This was followed during the next thirty-six hours by several additional attacks, the patient gradually weakening. Under increased doses of opium and brandy and of brandy and tinct. of valerian she however revived, and during the next two months attacks were mild in character. Then came a paroxysm to which I thought the patient would succumb. The same treatment, supplemented by galvanism (Duchenne), and applications of ice over the heart (Romberg) finally conquered. During the intervals tinct. of valerian was used with very comforting effect, apparently acting as a prophylactic. A new attack appeared, and for the first time I resorted to the nitrite of amyl. Beginning with two drops, I was obliged to increase the dose (given by inhalation) until I used nearly a teaspoonful. The effect was happy. The attack was cut short. In the subsequent three or four attacks the pain was less severe, and teaspoonful doses of nitrite of amyl invariably conquered, and eventually relieved the patient of further annoyance. During the past eighteen months no paroxysms have appeared. These attacks occurred at intervals which comprised a period of six months, during which time the left arm was not only constantly numb, but lost in strength as well as in size as compared with the right.

It was this case which revealed to me the marked difference, in the course of an attack, between the radial pulses. Indeed, I finally found that the contracted left radial preceded an attack, and that the patient simultaneously felt the sensation of an oncoming paroxysm. Guided by this symptom, I frequently administered remedies before any other symptom appeared, and found it invariably the case that so soon as the left pulse resumed its normal size, painful sensation ceased. During a paroxysm the right pulse assumed a size smaller than was normal, but while it was always perceptible, the left frequently disappeared. This condition of things led me to suspect vaso-motor spasm in the left arm. It is possible that the theory of Von Dusch, which attributes the small radial pulse of a paroxysm to spasmodic contractions of the heart, which allow only an incomplete diastole, and hence an imperfect supply of blood to the arteries, is correct. But this occurs during an attack, and does not account for the narrow left radial preceding a paroxysm. Nor does it explain the notable difference in size between the right and left pulses in height of an attack.

In the case just detailed, the routes taken by the pain were sharply outlined. They ran to the left ear, to the left side of the lower jaw, to the œsophagus (causing globus), to the larynx (producing aphonia); involved the phrenic (as shown by singultus); also the brachial plexus and the ulnar to the fingers. The case gave me opportunity to test the whole repertoire of remedies for angina pectoris, which are praised by various writers. Stimulants, opium, and counter-irritants were the most serviceable, yet did their work indolently, and with each new attack gave me a wearying round of action.

Romberg's ice treatment and galvanism, recommended by Duchenne and others, merely increased the discomfort of my patient. My experience

has taught me that nitrite of amyl is the best known remedy for angina pectoris. There are cases on record (Fagge's, etc.) in which it failed. At my hands it has never done so, and although in my fifth case it did not preserve life, it was of great use, as will be seen.

I find that many physicians lack the courage to use so powerful a remedy. This fear, I believe, to be ungrounded. I have never yet seen the slightest ill results from its use, notwithstanding the enormous doses required in my first case. If my patient be a novice to the remedy, I begin with one or two drops, and, watching the effect, increase the quantity until it gives relief. With the exception of the one case in which I used the liquid in nearly drachm doses, I have never been obliged to exceed eight drops at an inhalation. My habit during the administration is to keep my finger on the pulse, and watch the *nose* of the patient. The pulse commonly runs up to 120, 130, 140, and at the same time the nose and afterwards the face becomes deeply flushed. So soon as the nasal flush appears, I at once remove the handkerchief, even though the pulse be not greatly accelerated. Following this course, I have seen nothing but relieving effects. Headache of considerable intensity sometimes temporarily sets in, but should not be considered (unless unbearable) until the heart becomes relieved. Under the effects of the remedy the patient occasionally suffers a general but transient discomfort. Those who wish detailed information concerning the physiological action of the nitrite of amyl, may find it in the valuable and interesting paper by Prof. H. C. Wood, Jr., in the number of this Journal, for July, 1871.

CASE II. This case is that of a young lady who suffers mild attacks of angina pectoris, which cause pain and a heavy feeling about the heart, pain which shoots up the left neck, and pain in the left arm, involving the third and fourth fingers, and producing a contracted left radial.

In this case I have used no other remedy than the nitrite of amyl, to the effect of which the patient is exceedingly sensitive. I am unable to use more than three-drop doses, and generally during the second inhalation, with a spasmodic shudder, the patient flings herself away from the handkerchief. By this time she is, however, invariably relieved. The effect of the remedy upon her is unusually profound. She remains in a semi-unconscious state one to three minutes following the final inhalation. I mention her case in the present tense because, although much better, she continues to send for me at intervals of two or three months, in order to gain the relief which she never fails to find in a single inhalation.

CASE III. was that of a young lady who received the attack while in church. I found her in a convulsive condition as to limbs and fingers, and unable to respond, being apparently unconscious of the sound of my voice. The right hand was occasionally clutched over the heart. There was the very small left radial pulse as compared with the right. Removing the patient to fresher air I gave her brandy with aqua ammoniæ, meanwhile sending for nitrite of amyl. No change had taken place when it arrived. I administered two drops. With the first inhalation the patient, evidently startled, began to shriek wildly, in spite of which I continued the inhalation, and was rewarded by the return of her ability to

speak. She felt relieved of pain, which had been "frightful." After two additional inhalations, which relieved her still more, the patient was removed to her residence, where, after one more administration of the remedy, I left her in comfort. On the following day she complained of a sore and heavy feeling in the cardiac region, for which I did nothing. The next morning she came to my office to ask relief from this discomfort. A single inhalation of the nitrite of amyl relieved her completely, and up to the present time (a lapse of thirteen months) she has suffered no return of the paroxysms.

CASE IV. was that of a fourth young lady, who for several months had experienced a dull pain in the cardiac region, no remedy which she had received having relieved her. I tried the effect of valerianate of zinc and Quevenne's iron. A slight relief was the result. Within three weeks of her first visit, I was one day called to her house. Found her in a paroxysm of angina pectoris. I went prepared with the nitrite of amyl. She could not bear more than one drop. Five inhalations of one drop each relieved her, not only of the paroxysm, but also of all traces of the pain to which she had for months been the victim. Heretofore unable to move quickly, to go up stairs, or drive, without additional pain, she subsequently was, and has ever since been, able to take long walks, dance, run up stairs, and ride horseback, without the slightest sensation of discomfort.

The four patients, whose cases I have cited, were of ages between 19 and 25 years, and the closest examination revealed no hint of any affection of the heart.

CASE V. was a female, æt. 57. The attack for which I treated her had been preceded during the past seven years by four others of a milder type. I found the patient almost in a state of collapse; face livid; surface of the body bathed in perspiration; pulses small, especially the left radial; there was agonizing pain about the heart extending to the occiput, left shoulder, and upper left arm; singultus, globus, great dyspnœa, and difficulty of speech. The heart sounds were weak but normal. The organ was acting irregularly. I administered nitrite of amyl, by inhalation, in five drop doses. The patient experienced immediate relief, and in the course of thirty minutes resumed an almost natural look, colour returning to the cheeks, breathing becoming much freer, and the ability to speak being restored. Attacks of lesser degree appeared during the next hour, which I vainly endeavoured to relieve by hypodermic injections of morphia and a variety of powerful stimulants. The patient was growing rapidly weaker from the effects of the first paroxysm. Under the circumstances I felt unwilling to continue the use of the nitrite of amyl, but nothing else gave her the slightest relief, hence I again administered it in smaller quantity. It quenched the pain, and permitted the patient to assume a horizontal position. I then began to give her strong doses of brandy and aqua ammon. every quarter or half hour, but she gradually and quietly sank into a new collapse, which ended in death four hours after the first attack.

Here was a case in which I found the patient in the very throes of death, out of which I am confident that nothing but the nitrite of amyl could have delivered her. She became sufficiently restored to receive the ministrations of her pastor, speak with her family, and be prepared for the end. Besides this she was freed from pain, and died calmly. The

shock and effect of the first spasm were more than her heart could bear with impunity, as will be seen by the details of the post-mortem.

The autopsy revealed a heart well covered with fat; valves normal; slight atheroma of the aorta ascendens; right ventricle extremely thin and flabby; left ventricle in an apparently fair condition, but rather light in colour; papillary muscles shortened and thickened; liver markedly fatty; no other organs examined. The microscope showed that the muscular tissue of the heart was in a state of decided fatty degeneration. It is probable that this condition of the heart would be accused as the cause of the paroxysms by those who believe that angina pectoris *depends* upon a diseased state of the organ.

Wood, in his *Therapeutics*, thinks the administration of nitrite of amyl, when the heart is in an advanced stage of fatty degeneration, is attended with danger, because of its effects upon the cardiac muscle. In the case last mentioned, however, death would have ensued in a few minutes after I reached the patient but for the quick effects of the nitrite; other remedies were perfectly impotent.

I have presented many conflicting opinions as to the nature of angina pectoris, but, supported by the judgment of acute and reliable observers, have endeavoured to show that the disease neither necessarily depends upon cardiac affections, nor is confined to middle and advanced age, as is asserted by various influential writers; that there may be a functional as well as an organic form of angina pectoris, although I prefer to believe, with Laennec and Trousseau, that even when a paroxysm occurs as a complication of heart disease, it is rather a coincidence than a symptom, for the majority of cases of disease of the heart do not experience attacks of the angina; further, that no attacks are of pseudo or simulative nature.

Finally, I wish to urge upon physicians the great value, in this malady, of the nitrite of amyl. It is nearly invariably certain in its relieving effects, acts almost at once, is quickly, easily, and, with proper caution, safely given, and spares both patient and physician the tiresome, often ineffectual, use of the scores of remedies which are mentioned in the books.

In my hands this remedy has proved equally effectual in asthma (except when patients have been in extreme old age), as well as in the spasm of colic, in which I have used it with success in two cases. I would resort to it in any form of spasm, and I may add that since my paper was put in type, I have met with the happiest results in treating a case of obstinate spasm of the diaphragm by the same means.

ART. III.—*Remarks on the Etiology of Choked Disk in Brain Disease.* By EDWARD G. LORING, M.D., of New York. (With a wood-cut.)

FEW more interesting problems have ever been offered to the student of medicine in its broadest and most comprehensive sense than that embraced in the connection between the eye and the brain and the ability to determine with the ophthalmoscope the morbid conditions of the one from those of the other.

This is particularly true in regard to optic neuritis, and chiefly in respect of the special form known as "Stauungspapille" or choked disk, the true cause of which has excited and is still exciting so much discussion.

The great difficulty, as well as interest, of the problem is shown quite as much by the eager haste with which the majority have accepted the theories successively offered to them, as by the ingenuity and plausibility of the arguments advanced in support of these theories.

The three most prominent theories brought forward to account for the production of choked disk have been in turn that of Graefe, that of Benedikt, and that of Schmidt. This last was founded upon the physiological researches of Schwalbe, and perhaps because it is the last, and perhaps too a little out of desperation, it has been accepted almost universally, both at home and abroad, as the true explanation of the group of appearances seen in Stauungspapille.

It is to the last of the three that the following remarks will mostly apply, only enough being said in regard to the former two to render a discussion of the last possible.

In a paper read before the Society of Neurology and Electrology, it was shown from the anatomical structure of the eye, from numerous physiological experiments, and post-mortem examinations, that there was every reason for believing that the circulation of the eye, though derived directly from that of the brain, was to a marked degree independent of it. That is to say, that the eye itself through the intraocular pressure possessed a self-regulating power, so that the circulation in the cranium might be seriously interfered with, by ligation of the vessels in the neck, and by other means, and yet that of the eye remain unaffected.

Notwithstanding this apparent want of sympathy between the circulation of the eye and brain, Graefe, nearly twenty years ago, announced the belief that the circulation of the eye might, so to speak, be looked upon as the visible index of the condition of the intra-cranial pressure, so that any increase in this would show itself by a change in the condition of the vessels of the disk, which would be expressed, if sufficiently marked, in the complex of appearances known as "choked disk."

In considering this theory of Graefe, it is important, at the outset, to bear in mind that the term intra-cranial pressure has no reference to the

relative quantities of blood or other fluid at a given moment in the brain, or even to the condition of the cerebral substance, but is simply used in reference to and in comparison with the normal equilibrium which exists between the lateral pressure of the united contents of the cranial cavity, and its resisting walls.

The essential point, therefore, in Graefe's theory was the disturbance of the normal amount by an increase in the lateral pressure, which would show itself at the optic nerve entrance. The manner in which this increase in pressure was brought to bear on the somewhat distant circulation of the eye was, according to Graefe, purely mechanical, and is briefly as follows:—

If the intra-cranial pressure be increased, this will be reflected in all directions, and of course exert its influence upon the cavernous sinus. As the vein is more compressible than the artery, it will be the first to yield to the pressure. An impediment to the return circulation through the ophthalmic and retinal vein would take place, and there would be a banking up, so to speak, of the venous current, especially when it met the constriction, or collar, formed by the sclera round the ocular end of the nerve as it pierces the globe. Here, on account of this anatomical constriction, swelling from irritation of the surrounding parts would occur. This would only increase the trouble till almost complete strangulation took place, followed by all the peculiar ophthalmoscopic signs, and morbid appearances, shown in microscopic sections.

The peculiar symptoms of Stauungspapille might, according to Graefe, spring from any cause which increased intra-cranial pressure, such as tumour, meningitis, dropsy of the ventricle, hypersecretion of the sub-arachnoidal or cerebro-spinal fluid. Nor did the size or position of the tumour or growth have any significance. It might be the size of a cherry or as large as an orange; and it might occupy any position, provided irritation enough was created to produce an increased pressure of the contents of the cranium. Here, too, it should be borne in mind that all cases of disease, whether of the brain or investing membranes, are not necessarily followed by increased intra-cranial pressure. On the contrary there is no reason why the originally normal tissue should not be supplanted in the cavity of the head, as it is so often in the eye, by an abnormal growth which so gradually takes the place of the pre-existing tissue as to cause no disturbance to the normal equilibrium of pressure. That this may happen in the case of large growths, experience proves; while on the other hand the smallest growth for some unaccountable reason may excite so much irritation to the surrounding parts, or in some subtle way so affect the vessels themselves, as to produce increased pressure, either through excess of the fluid or expansion of the solid contents of the cranium.

That there should be intermissions and remissions of these attacks of inflammatory irritation, when the disease itself and its influence on the

surrounding parts should remain quiescent, is as natural here as in other parts of the body.

Graefe's theory was considered sufficient for some years, supported as it was both by clinical observation and post-mortem examinations. Objections to it gradually began to be heard, however, and these took a definite shape in a paper written by Benedikt in 1868.[1] He asserted: First, that the growth was often too insignificant and of too mild and non-inflammatory a nature to set up such a degree of pressure in the head as to affect so distant a circulation as that of the eye. Secondly, that clinical experience taught that the neuro-retinitis might abate entirely without any reduction of the tumour. Thirdly, it was hard to see why pressure should offer hinderance to no other circulation, and should set up morbid action in no other nerve district than that of the eye.

Benedikt's views in opposition to the pressure theory and those in support of his own are too numerous and too long to receive further discussion here, though much might be said, as indeed it has been, in opposition to his arguments against Graefe's views, while much that he offers in favour of his own theory is untenable.[2] The theory itself was, that some irritation was brought to bear on the sympathetic nerves, and that this irritation was propagated in some subtle way to the vasa-motor filaments which regulated the circulation of the disk;—in other words, that the neuritis was one of abnormal innervation of the sympathetic system.

This theory of Benedikt's is certainly a very plausible one, and there is much in its favour which has never been satisfactorily refuted, though this in itself may be due to its vague and intangible nature, which seems to defy anything like actual demonstration.

Following the theoretical objections of Benedikt came the anatomical ones of Sesemann.[3] His objections to the pressure theory are important, and are as follows:—

1. "The cavernous sinus is a blood canal surrounded by such impervious walls as are rarely met with, and a pressure sufficient to really compress this must, since the pressure within the cranium must be regarded as equal in all directions, exercise enormous pressure on all the other bloodvessels.
2. "Both the superior and inferior ophthalmic vein anastomose extensively with one another, and also with the facial vein, and although the vena centralis retinæ empties itself almost immediately into the cavernous sinus, yet it previously anastomoses with the superior ophthalmic vein. So long then as the facial vein is open, the blood from the central vein of the retina could pass unimpeded through it.
3. "All increase of cerebral pressure is not followed by neuritis.
4. "Optic neuritis is sometimes one-sided, and has been observed on the side opposite the eye affected."

Forcible as these objections are, they are not, however, it seems to me, conclusive. In the first place, it has never been proved that increased

[1] Elecktrotherapie, Wien, 1868, p. 249.
[2] Archiv Anat. Phys., etc., pt. 2, p. 154, 1869.
[3] For a discussion of this subject see Allbutt, *On the Ophthalmoscope*.

pressure must necessarily be extended equally in all directions, as it no doubt would be were the cranium a simple sphere. It must, however, be borne in mind that the brain is divided by numerous partitions, in the shape of fibrous and inelastic membranes, which are at numerous places bound down firmly to bony attachments, so that it is easily conceivable that pressure sufficient to exert an influence on some delicate nerve fibres might exist in one part of the brain and yet not extend itself to all others, or, the pressure existing in one portion of the brain, its effects might be propagated to a more distant portion through the medium of the nerves, especially the vaso-motor filaments.

The fact that neuritis optica occurring on one side only could not exist under the pressure theory, is based on the assumption that the pressure is always equally distributed in all directions.

Another forcible argument against Graefe's theory might be brought forward in the fact that we may have the return circulation through the ophthalmic vein interfered with, caused, as shown on the autopsy, by some obstruction in the orbit or in the vein itself, and yet no impediment to the circulation through the retinal vein occur. Cases, though rare, are yet occasionally met with, where exophthalmos of a large amount exists on one side, and where marked interference to the return circulation through the ophthalmic vein is undoubtedly present, with a large degree of distension and tortuosity of the supra-orbital and other superficial branches of the facial, and yet where the ophthalmoscope shows that the fundus of the eye is perfectly normal, and where there is not a particle of interference in the circulation of the central retinal vein. This could not be if the theory of choked disk was based on a mere mechanical impediment to the return blood into the sinus by way of the ophthalmic vein.

The fact that in these cases, the retinal circulation was undisturbed would go to support Sesemann's view, that, if the passage through the ophthalmic to the sinus was blocked, the blood from the central vein of the retina could pass unimpeded by the facial vein by means of the anastomosis which exists between this and the ophthalmic vein.

About the same time that these objections were brought forward by Sesemann, Schwalbe[1] was making his investigations into the lymph spaces of the eye and optic nerve. He found, that, by injecting fluid under the arachnoidal membrane of man as well as of the lower animals, that is to say, into the subarachnoidal space, the fluid forced itself under a moderate pressure into the space between the outer and inner sheath of the optic nerve.

These experiments by Schwalbe were followed by others of the same character by Schmidt,[2] Wolfring,[3] and Michel,[4] and others. And although

[1] M. Schultze's Archiv, Bd. vi., 1869.
[2] Archiv, Bd. xv. 2, 1869.
[3] Archiv für Ophth., Bd. 18, 2, 1872.
[4] Archiv für Ophth., Bd. 18, 1, 1872.

there were discrepancies of greater or less significance in the results obtained by the various observers, all agreed upon the one important point which interests us here, and that is, that fluid would pass from the sub-arachnoidal space in the brain into the space formed by the two sheaths of the optic nerve. It was claimed, therefore, that the fluid when it arrived at the ocular end of the optic nerve, would occasion stasis of the circulation and all the phenomena expressed in neuritis or choked disk; and it is claimed also that this must be the true explanation, because fluid has actually been found between the two sheaths in some of these cases which have come to autopsy.

But it by no means follows, it appears to me, that, because fluid has been found in some cases of neuritis between the sheaths of the nerve, this necessarily has come down from the brain.

There are certain anatomical considerations which would render such a passage of the fluid very difficult. For, admitting that the fluid was in such quantities within the cranium as to fill the spino-arachnoidal space and the base of the skull, and admitting, too, that the pressure was sufficient to force the fluid between the sheaths, there are still other anatomical factors which would play an important part, both as cause and effect. For it must be remembered that the optic foramen is a bony canal of only a moderate diameter, and that the optic nerve and investing membrane fit it pretty exactly. Moreover, through this bony canal passes the ophthalmic artery.

If fluid was forced between the sheaths in this bony canal, it would cause the same irritation at this end of the nerve that it is claimed it does when it has arrived at the bulbar end. There would be swelling of the parts, with compression, especially as they are inclosed within bony walls. Either the nerve would be compressed and vision would suffer, or the ophthalmic artery would be compressed, and the circulation of the orbit would be interfered with. Now, it often happens that vision in the most pronounced cases of Stauungspapille is not disturbed,[1] nor is there the slightest interference with the circulation of the orbit.

Again, if fluid was forced by these resisting parts, irritation would be set up, and we should have inflammation not only of the investing membranes, but also of the trunk of the nerve, and it usually happens in choked disk that the end of the nerve is perfectly free from disease, while the end near the eye is affected.

Moreover, if swelling of the cranial end of the nerve and the surrounding parts did take place, then not only the two sheaths of the optic nerve would be pressed together, cutting off their connection with the corre-

[1] Of course there are cases in which there has been compression of the nerve within the bony canal, caused by inflammation of the investing sheaths and nerve-trunk, with swelling of the parts. In these cases vision is affected; at times even to total blindness.

sponding spaces in the head, but the inner sheath would also be pressed against the trunk, and the lymphatics[1] proved to exist beneath this sheath would also have their connections severed, and their contents, instead of being carried into the cranial cavity, would be backed up in the nerve, and especially between the sheaths. The expression of this stasis would then be not so much at the cranial end of the nerve as at the ocular, for at the cranial end the sheaths are in more intimate relation with the trunk of the nerve, and the nerve is more closely embraced by the tendons of the various muscles and orbital tissues. It would, on the contrary, have a freer expansion near the bulb, and this is just where we find the distension of the sheath the greatest.

Now, in regard to this distension of the sheath. It is no new thing. It was noticed by some of the earlier writers, and later by Van Ammon.[2] It was shown to be due to two causes; first to direct inflammation of the sheaths themselves, by which they became very much thickened. Secondly, by a collection of fluid between the two sheaths themselves, and within the interstices of their parenchyma. In both cases the extension had a *cone-like form, the base of which was near the eye.*

If, now, this distension of the sheath is due to an inflammation of the sheath itself, either interstitial or œdematous, then we ought to find this condition of things more frequently with neuritis descendens, than in simple choked disk, and rather in the more advanced cases than in the fresh. And this is just what we do find on autopsy, as was pointed out by Graefe in his first article.[3] Here Virchow made the autopsy, and says: "The optic nerve showed in its entire length a very strongly marked thickening of the neurilemma of the nerve, and a cystoid or bladder-like separation of the same from the trunk of the nerve itself; and besides this perineuritis, there were the appearances of an interstitial neuritis for the entire length of the optic tract."

Von Ammon[4] several years before observed the same thing, and states that separation between the two sheaths to such a degree as to form bulbous projections does not, as a rule, take place before cavernous openings in the parenchyma of the sheaths themselves have been formed.

To render this more clear a cursory glance at the anatomy of the part may be of assistance.

According to the latest investigations the optic nerve is provided with an outer and inner neurilemma. The outer is called by Schwalbe, from the fact that it is a direct continuation of the dura mater, the dural sheath, the inner, from its analogy to the pia mater, the pial sheath. Between

[1] Schwalbe and Wolfring, loc. cit.

[2] Archiv für Ophth., Band vi. ab. 1. p. 15, 1860.

[3] Zehnder's Monatsblätt. 1864, p. 369. For this and other cases see, also, Archiv für Ophth., Bd. xii. ab. 2, p. 114.

[4] Archiv für Ophth., Band vi. ab. 1, p. 15, 1860.

the two is a space which is called the subarachnoidal space of the optic nerve, which is the continuation of the subarachnoidal space of the brain.

"The dural sheath," continues Schwalbe,[1] "is the thickest of the investing membranes of the optic nerve. As this sheath is the direct continuation of the dura mater, and passes directly into the sclera, it partakes in a marked degree of the characteristics of both these membranes. Its thickness, however, is not always the same, but amounts, on the average to 0.5 m. (Henle). Towards the bulb it increases in thickness, and what was in its earlier course a single fibrous membrane, at a distance of about 7 millimetres from the entrance of the nerve into the sclera splits, at first into two or three, and finally into four lamellæ, which are separated from each other by small interspaces. Each of these divisions passes over directly into the sclera."

The drawing, which is borrowed from Schwalbe, shows this separation of the dural sheath (v) into its four lamellæ and their continuation into the sclera. (sc.) Besides the peculiar arrangement of the sheath, as shown in the drawing, there is another important anatomical point which should be kept in mind, which is, that this part is the most vascular portion of the nerve, containing, besides the vessels proper to the sheaths, ramifications from the central artery, and branches from the short ciliary arteries through the scleral ring.

Bearing this in mind, and also the fact that a neuritis, intra-ocular or otherwise, might be easily propagated to this part of the sheaths, we can readily understand why the dilatation occurs so frequently at this part of the nerve, and why it is cone-shaped with its base towards the globe. And we can further understand how it may well happen, when the inflammation has gone so far as to effect the parenchyma of the sheaths in this part, that there should be cavernous openings between the lamellæ noticed in the earlier observations.

What I wish to emphasize is that the distension of the sheath is due to disease of the sheath itself, and has no necessary connection with the fluid from the brain; and I have not seen a single case, in which the autopsy has been made by these observers, to prove that the fluid came from the brain, that the sheaths of the optic nerve were not themselves diseased, from Mitchell's case down to those reported by Dr. Norris at the last meeting of the Ophthalmological Society at Newport (1874). Again, how does it happen, as pointed out by Iwanoff[2] and von Ammon,[3] that the nerve and sheaths are sometimes found diseased at both ends, and the intermediate portions healthy?

I have, myself, seen a similar case, which was one of tumour of the

[1] Handbuch der Augenheilkunde Graefe and Sæmish, part 1, p. 332.
[2] Zehender, 1868, p. 422. [3] Loc. cit.

brain. The ophthalmoscopic appearances just before death were those of a virulent neuritis with much swelling of the disk and surrounding tissue. At the autopsy the sheaths of both nerves were found diseased for almost their entire length, with bulbous extensions near the globe. At about the centre of the intra-orbital portion of the nerve of the left side, there was a deep constriction of some two lines in extent; this surrounded the stem of the nerve tightly like a collar. It was caused simply by the non-extension of the nerve at this point under the inflammatory process, the sheaths being here in contact with the nerve-stem. How is it possible in such cases as these that the distension at the ocular end should be caused by fluid passing from the brain through the arachnoidal spaces, unless, indeed, it goes through the stem of the nerve and thus round the constriction? Such an explanation is certainly far-fetched, if not impossible.

These being some of the negative proofs against the theory, now for the positive.

If, in an aggregate of symptoms and appearances in any disease, we can eliminate certain existing phenomena, and the character and appearance of the disease still remain exactly the same, it is a proof positive that the excluded phenomena could not have been essential factors in the production of the disease, although they might have existed with it. So, too, if we could point to a single authenticated case made by a competent observer in which the ophthalmoscopic picture was typical of choked disk, and the autopsy showed that there was neither any disease in the nerve-trunk nor any distension of the sheaths, then it would be a proof positive that fluid from the brain could not have been the cause of the choking of the disk. Now, we can not only point to one such case, but to many. It was precisely on this point that Graefe insisted so strenuously, namely, that in those cases which were examined ophthalmoscopically by him, and at the autopsy by Virchow[1] and Schweigger,[2] the changes were limited to the *intraocular end* of the nerve—the disk—and did not extend backwards beyond the lamina cribrosa, as a rule, though in some cases the inflammation was propagated backwards towards the brain (*neuritis ascendens.*)

Is it not then more reasonable, when we find the cranial end of the nerve and its sheaths healthy, and the ocular end distended, to believe that the distension comes rather from interference with the circulation in and about the ocular end, which we know, from the labours of Zinn, Jaeger, and Leber, draws its blood from so many sources, than to believe that the fluid has filtered down through a long track without leaving a trace of its existence or passage in the nerve or its sheaths, to finally bulge out round that part of the nerve which is nearest the eye? As a single exam-

[1] Archiv für Ophth., Band vii. ab. ii. p. 63, *et al* [2] Ibid.

ple of this, one of Iwanoff's cases may be cited. This was a case of well-marked Stauungspapille, which had been examined, for a space of three years before death, with the ophthalmoscope, by both Mauthner and Becker. It was shown by Iwanoff,[1] at the autopsy, that the changes were limited to the intraocular end of the nerve—the disk—and did not go beyond the lamina cribrosa.

But it may be said that these examinations by Schweigger, Virchow, Iwanoff, and Von Ammon were made before Schwalbe's investigations had been made known, and that the attention of these observers was not directed critically to the condition of the sheaths. But this is precisely what it was directed towards, as they were drawing conclusions between the conditions of Stauungspapille, where only the intraocular end of the nerve was affected, and the more diffuse form of neuro-retinitis, where the nerve, not only within the cranium, but also in the orbital portion, with its sheaths, was diseased and distended.

But there are cases of autopsy made since this theory was fully ventilated, and made expressly to establish this point. For example, the case in which the autopsy was made by Mr. Swanzy, of Dublin, and figured in Allbut's book. The disease was confined to the disk, the nerve-trunk itself being perfectly normal. To this may be added the following case of Pagenstecher.[2]

The man died of a tumour in the right middle lobe as large as an orange, which the examination showed to consist of a large, irregular mass, like clotted blood in various stages of transformation. Before death there were the ophthalmoscopic appearances of choked disk. At the autopsy the size, colour, and consistence of both nerves appeared perfectly normal throughout their entire course up to the globe.

"The exterior and interior sheath, as well as the intervening connective tissue, do not exhibit any abnormality even in the immediate neighbourhood of the bulb. The changes were limited to the lamina cribrosa." And what is more, the autopsy showed that not only was there no fluid between the sheaths, but also that there was none in the cranial cavity, for "the cranial bones were remarkably thin and diaphanous. The dura mater was natural. The proper membranes dry on surface from swelling of the brain. No lymph anywhere."

I have myself seen two cases where there were all the ophthalmoscopic signs of choked disk during life, and where the autopsy showed a reduction of the normal quantity of fluid in the cranial cavity.

Again, how can we explain the occurrence of Stauungspapille in a single eye on this principle? For, if the fluid was forced through one optic foramen, why should it not be through the other? It may be suggested that the growth might occupy such a position as to shut off the

[1] Zehender, 1868, p. 442.

[2] Ophth. Hospital Reports, vol. vii., pt. 2, p. 126.

fluid from the optic foramen of one side, and allow it to pass to the other. But this cannot hold good, as is conclusively proved by some cases, of which the following, from Pagenstecher, is an example.[1]

"The patient died from a large gliomatous tumour in the left hemisphere. The left eye, at the autopsy, was seen to be perfectly normal, while in the right the papilla was very prominent, measuring four times the height of the left from the lamina cribrosa. There was an enormous distension of the external sheath *near the eye*, but at about the distance of half an inch from the insertion of the nerve into the sclera this pretty closely invested the nerve, while in the other eye the sheaths bore their normal relations to the trunk of the nerve."

Such cases of one-sided neuritis are utterly irreconcilable with the theory that the choking of the disk has been caused by fluid being forced from the brain between the two sheaths of the optic nerve. They are also inconsistent with Graefe's theory of a general increase of pressure which is equally distributed through the cranial cavity. They could only exist under the pressure theory with the admission that the pressure, instead of being equally distributed through the whole brain, might be restricted to a particular region. That such a restriction might exist does not from anatomical reasons appear impossible or indeed improbable. This would apply especially to the base of the brain, or to that portion which lies beneath the tentorium.

It would seem then, if the foregoing arguments are of any value, that, although Graefe's division of neuritis into two kinds—the descending and ascending—is borne out, his explanation of the cause of choked disk is insufficient, though it must be admitted that increased intra-cranial pressure is an important factor in its production.

It would also appear that the theory of the production of choked disk based on fluid passing from the cranial cavity between the two sheaths of the nerve is untenable; and further, that the appearance of the fluid at the ocular end of the nerve is rather the result of a diseased condition of the trunk and sheaths of the nerve than a cause of choked disk.

It would seem then, after all, that Benedikt's theory is the least assailable, though it may be so, as some claim, because it is the least demonstrable.

In view of these facts, might not the true explanation be found in a combination of the two theories?—that is, that choked disk, in connection with brain disease, is the expression of a compression within the head of certain nerves, and that the effect is transmitted along such nerve fibres as run to the eye and preside over the blood supply and maintain the healthy processes of waste and repair at the disk, on precisely analogous grounds as that the cornea is affected in certain morbid conditions of the fifth pair.

[1] Ophth. Hospital Reports, vol. vii.

This interference with the normal condition of the nerves by compression might then take place from various causes, either by imprisonment of the fibres by the morbid growth, or by direct pressure by this latter upon the nerves. Again, it might occur by a general elevation of the intra-cranial pressure, which extended equally in all directions, or which was confined to a particular region. The fact that the cavernous sinus contains branches of the sympathetic system might have some weight in the question.

My excuse for dwelling so long on so technical a point is so much better expressed in the words of a colleague, that I most willingly shield myself behind them. Dr. Noyes, in his recent report on ophthalmic literature, says:—

"The researches of Schwalbe and Schmidt have done so much to establish an intimate connection between the optic papilla and the brain, both in anatomy and pathology, that the subject cannot be dropped until it has been completely exhausted. In fact, it is imperative that we should possess the most absolute and complete knowledge of the whole matter. Without it our inferences from the phenomena of the optic disk must be uncertain and vague. On the one hand, we should fail to properly appreciate all that occurs in intraocular pathology, and still more egregiously must we miss the mark when we begin to reason from these data to intra-cranial lesions. The papers above quoted supply us with important facts. But, with the most exact knowledge we can have, can any critical and logical observer with the ophthalmoscope be willing to use the word cerebroscopy when he is studying only the optic papilla?"

This question, so far as our present knowledge extends, must certainly be answered in the negative, for the simple reason that it is becoming every day more apparent that we may have the ophthalmoscopic appearances which are typical of choked disk, and which are not connected with any cerebral trouble whatever, but are due simply to some orbital or even intraocular disease.

Interesting and important as the investigations of Hiss, Arnold, Schwalbe, and others into the lymph spaces of the brain and eye really are, they nevertheless do not appear to have cast any light upon the etiology of choked disk, the true cause of which seems to be as great a mystery as ever.

It is unnecessary for me to add a single word in regard to the great merits of the ophthalmoscope as an essential, at times even an indispensable, agent in the diagnosis of brain disease. This is recognized throughout the world. It is only the ignorant who alike underrate its virtues or over-estimate its capabilities.

ART. IV.—*On the Diagnosis of Mild Cases of Typhoid Fever, with a consideration of the Afebrile and Abortive Forms.* By W. W. JOHNSTON, M.D., one of the Physicians to the Children's Hospital, Washington, D. C.

THE difficulties which attend the recognition of the milder cases of typhoid fever are due to the unlikeness which they bear to the more common and characteristic forms of the disease. The departures from the accepted type are in two directions: either in a loss of intensity of the morbid phenomena with a feeble development or absence of the pathognomonic symptoms, or in a considerable shortening of the attack. The embarrassments of diagnosis, therefore, occur in mild and in short cases.

It is proposed to consider, first, the symptomatic history of the milder forms, and to endeavour to ascertain the minimum state of symptoms which warrants the diagnosis of typhoid, and then from the observation of shorter attacks to determine their narrowest limit in time.

I. In order to reach a decision as to what is the feeblest manifestation of the typhoid infection, we might answer the following questions: Does any combination of the most constantly associated symptoms, or does any one symptom, exist of necessity in typhoid fever? What is the most reliable symptom in the absence of all pathognomonic phenomena?

The *abdominal symptoms*, being the most characteristic and most frequent, should be first noticed. Louis relates a case (Obs. 41, *Gastro-entérite*, vol. ii. p. 332) that ended fatally through perforation of the intestine, in which the symptoms were so insignificant, that had the case gone on favourably a simple "*embarras gastrique ou intestinal*" would have been thought to exist. Murchison (*Lancet*, Dec. 10, 1870) reports the following:—

"A boy, aged 17, was out of sorts for ten days, stopped work on October 6; had no diarrhœa, and continued to walk about until the afternoon of the day preceding admission into the hospital; he was then taken with sudden pain in the abdomen. When seen he had all the symptoms of acute peritonitis. He died October 16, in twenty-four hours after coming into the ward. After death typhoid ulcers were found in the bowel, answering to about the eighteenth or twentieth day of the disease. One patch of Peyer was the seat of a deep ulcer which had opened into the peritoneal cavity; 'the contents of the bowel were found in the peritoneum, and there were signs of extensive recent peritonitis.'"

Bennett (Case CCXXI., *Principles and Practice of Medicine*) gives the history of a man who died on the sixth day of a relapse; there was no tympanites, and the bowels were constipated until the day of his death. A perforation was found in the jejunum; Peyer's patches were prominent in the lower part of the ileum, and there were several ragged ulcers in the same locality. The peritoneum was congested, and there were flakes of lymph on the surface. Diarrhœa was not present in three fatal cases

observed by Louis (Obs. 8, 23, 53), where the symptoms were violent, death occurring in the first on the twelfth day, in the second on the fourteenth, and in the third on the thirteenth day, from perforation and peritonitis. Jenner also had two fatal cases without diarrhœa. Murchison, in commenting on his statistics, which showed diarrhœa in 93 out of 100 cases, says—

"Subsequent experience has satisfied me that diarrhœa is absent in a much larger proportion of cases than I have here indicated (in fully one-fifth), and that these cases are usually mild and recover. The fatal cases show that the gravest abdominal lesion may exist without its most closely related symptoms, hence it is but just to infer that very many mild attacks fail to show any signs of intestinal disturbance. More extended observation will alter our view of the frequency of diarrhœa."

The cases reported in this paper bear upon the point in question.

If *tympanites* be considered, it will be seen not to be a necessary accompaniment of enteric fever. It is said to occur in 79 per cent. of all cases. In 21 of 100 cases recorded by Murchison, the abdomen was flat throughout. In one-half of the mild cases of Louis it did not occur. In the attacks of children, Rilliet and Barthez assert that it rarely persists during the whole attack; it disappears at the end of the fifth or eighth day, and even in the most serious cases the abdomen may retract. It is probable that the importance of this symptom is over-estimated. In a given case two observers may come to opposite conclusions as to the fact of meteorism. Moreover, in childhood abdominal gaseous distension is almost a physiological state.

Passing in turn to the *rose rash*, which has a percentage of 76 in all cases, we find that it was seen in 4606 of 5988 observations in the London Fever Hospital during a period of twenty-three years. It is less common under ten years of age and over thirty. In 111 cases in childhood it appeared in one-fourth only. (Rilliet and Barthez.) The eruption is no measure of the gravity of the illness, and affords no indication of its course; it may be absent in the gravest forms. Bennett mentions three instances of this. In one (Case CCXIX.) there was considerable diarrhœa with marked bronchitis, partial pneumonia, frequent and feeble pulse, stupor, profuse sweats, and great prostration. The patient remained seventy-three days in the ward. "No eruption could be detected during the whole progress of the disease, though daily looked for with the utmost care." In the second (Case CCXX.) death occurred on the twenty-fourth day. The symptoms were diarrhœa, tenderness in the right iliac region, sordes on teeth, confusion of intellect passing into insensibility. No eruption was observed. The post-mortem revealed enlarged Peyer's patches and ulceration of the mucous membrane with other lesions. The third example (Case CCXXI.) presented above, of relapse terminating fatally, is of less importance; no spots were seen when under observation. The absence of this phenomenon does not, therefore, exclude the idea of typhoid fever.

*Enlargement of the spleen* is said by Louis to occur in 86 per cent. of all cases, but is much more common in those who die before the thirtieth day than in those who survive this period. Taupin found the spleen enlarged in one hundred and nine out of one hundred and twenty-one cases. Rilliet and Barthez dissent from this experience, having seen no increase in size but in twenty-six out of forty-four cases.

In this country and city the percentage is smaller than this; it did not occur in any of the mild cases recorded in this paper, nor to any appreciable extent in any severer cases seen during the last five years. It has little or no diagnostic value, more especially as it is a common lesion of the malarial fevers.

The opinion to which the above review leads is that the so-called pathognomonic symptoms of enteric fever are neither constant nor necessary. If the gravest lesions can run their course without affording certain evidences, or even any evidence at all, of their existence in by no means an inconsiderable number of cases, are we not justified in the belief that a slight degree of medullary infiltration of the solitary glands and patches is very often unassociated with diarrhœa, tympanites, rose spots, or enlarged spleen? The intensity of the symptoms, as a rule, is the measure of the disease; the probability of the absence of the symptom increases as the disease grows milder. A diminution in the number of the associated symptoms occurs *pari passu* with a reduction in their intensity.

Hence typhoid fever cannot be said *not* to exist when the above mentioned symptoms are absent, either singly or collectively, for our senses fail to discover before phenomena cease to exist.

This line of argument when pushed to its extreme would show that neither the specific nor accessory symptoms are required to constitute enteric fever, and that there is no one condition—no one altered function, in a hypothetical case, where all the phenomena of disease are reduced to their lowest level, which affords the data for determining the value of the morbid state or even that there is any morbid state at all.

This result would be perfectly just and warranted by observation as well as by reasoning. Liebermeister says "there are many cases that run a milder course; we find them less and less severe, till finally we come to those so mild that they scarcely warrant the name of disease."

But there is one symptom of which we have so far taken no account, but which lends itself to our study, and becomes a means of determining the gravity of the case as well as the nature of the disease when other modes of observation fail. *Fever* is the most constant symptom of typhoid fever; it is the last to disappear in the progress from disease to health; it characterizes the mild as well as the severe; it becomes, therefore, the only standard of comparison between all grades of the affection, and the only approximatively positive means of distinguishing the patho-

logical from the physiological state. Can we give a greater value than this to fever, and say that every case of typhoid disease must of necessity present an increase of animal heat?

Every disease, according to Virchow (remarks at meeting of British Medical Association, *Med. Times and Gazette*, Aug. 16, 1873), is a compound phenomenon, and to be understood must be divided into its elementary components. Fever depends on various local and general influences; it can be separated into a series of elementary processes, and is not "essential" to the local affections with which it occurs. The fever of disease can cease, as in pneumonia, the unity of the attack ending, but the "local affection can make further progress, and it can persist by a series of dangerous metamorphoses."

If this be a just opinion, the lesion of typhoid fever can persist to dangerous tissue change independently of fever. In the mildest forms of the malady, where "the local and general influences" are in a minimum state of activity, the resultant "compound phenomenon"—fever—might be absent altogether. Liebermeister (*Ziemssen's Cyclopædia*, Art. Typhoid Fever, p. 123) expresses the belief, which he supports by facts observed by himself and others, that there is a typhoid infection without fever. In his wards in 1869, there were 206 cases of well-developed typhoid fever, also twenty-nine cases of febrile and 139 cases of "afebrile abdominal catarrh," no inconsiderable portion of which, he believed, was to be imputed to typhoid infection. In 1870 there were 161 cases of typhoid, 26 cases of febrile, and 111 cases of afebrile abdominal catarrh. The proof of the nature of the diarrhœa in many instances was found in the presence of enlarged spleen, rose rash, marked languor and debility, detention in bed for four weeks or longer, with other more or less characteristic symptoms. The pulse was generally slower than normal, 48 to 60 to the minute, becoming more frequent as the other symptoms improved.

In Basle, where typhoid fever prevails to a great extent, it is not uncommon to find an evident enlargement of Peyer's patches in persons who have died of other diseases or from accident. Vallin relates a case (*Archives Générales de Méd.*, Nov. 1873) of severe intestinal hemorrhage in a typhoid patient who had previously been free from fever, and again of a fatal case of typhoid fever, death being caused by peritonitis, in which likewise no fever had been present until the peritonitis occurred. In his article he supports the following proposition:—

"Typhoid fever in rare cases can arrive at advanced periods of its evolution and reveal itself suddenly by grave and even fatal accidents without the temperature, as determined by the thermometer, sensibly departing from the limits of the normal state."

It is not important to decide at this point the question of the possible existence of an afebrile typhoid infection. The conclusion in view is that the specific disease may be so stripped of its familiar dress as to lose all

semblance of its nature, and escape detection except for the closest scrutiny. But the fever is the most persistent, the almost essential feature of its life; the most constant phenomenon in all forms and grades—the severest and the mildest—and hence becomes the only standard by which one case may be compared with another, or by which a determination of its nature can be reached.

The answer to the question—what is the minimum state of symptom which will lead to a recognition of typhoid fever? will be found only in the study of the fever of mild cases.

All cases are mild which have no higher evening exacerbation than 104° F., or in which this high point is not attained more than once or twice. Starting from this we pass from degree to degree in the descending scale until we reach afebrile states. The following series of mild cases illustrates various modifications of intensity:—

CASE I. M. Y., male, æt. 42, robust constitution, resided with his family in a house without water-closets. A privy in out-house one hundred yards off, was used by all the members of the household. The yard sloped from both sides towards the centre where was a well which supplied drinking and cooking water for this and the adjoining house. In the summer of 1874, there were several cases of fever in the neighbourhood. Mr. Y. was occupied during the day in one of the large hotels of the city. He had not used the water from the well for two or more weeks before illness began, as he noticed that it had a bad taste. The weather had been very dry, and there was less water in the well than usual. About June 24th, he began to complain of lassitude, headache, and occasional diarrhœa; these symptoms continued during the last week in June and first week of July, with "occasional" fever.

I saw him first on July 9th. He had been out in the morning, and complained of debility, headache, and constipation. There was undoubted fever, and the abdomen was distended. He was advised to go to bed, and a sedative and febrifuge mixture ordered.

*July* 10. The patient went out to-day against advice, but returned in a few hours complaining as before. The bowels at this date had not been moved for four days, and a mild purgative was prescribed.

11*th*. Tympanites, a few rose spots, and diarrhœa—four liquid stools—slight delirium, and tongue furred. Morning temperature 101.3°.

12*th*. Two liquid movements. Evening temperature 103.3°; pulse 110.

13*th*. Two fluid movements, delirium; pulse, morning 90, evening 112; temperature, A. M. 102.5°, P. M. 103.2°.

14*th*. Pulse, A. M. 88, P. M. 110; temperature, A. M. 101.8°, P. M. 102.6°.

15*th*. Condition unchanged; less delirium; mind dull; pulse, A. M. 90, P. M. 100; temperature, A. M. 101.5°, P. M. 102.4°.

16*th*. Pulse, A. M. 86, P. M. 106; temperature, A. M. 101.3°, P. M. 102.5°.

17*th*. No delirium; two loose discharges; rose spots still visible, tympanites; pulse, A. M. 78, P. M. 90; temperature, A. M. 99.8°, P. M. 101.2°.

18*th*. Mind clearer; general improvement; pulse, A. M. 78, P. M. 90; temperature, A. M. 99.9°, P. M. 100.6°.

*19th.* Appetite; bowels less frequently disturbed; discharges less fluid; no rose spots, tympanites less; pulse, A. M. 79, P. M. 80; temperature, A. M. 98.8°, P. M. 99.2°.

*20th.* On this the eighteenth day of the attack, counting July 9th as the seventh day, defervescence was completed.[1] Pulse, A. M. 78, P. M. 78; temperature, A. M. 98.6°, P. M. 98.6°.

Convalescence was rapid, and emaciation not great. The highest evening rise of temperature was on the ninth day of disease, and was 103.3°. The mean evening height during the fastigium was 102.3°. The first marked morning remission to 99.8° was on the fifteenth day of the attack.

CASE II. G. Y., æt. 12, son of former patient, living in the same house; kept out of the room during the greater part of his father's illness. On July 16th my attention was attracted to him. He complained of loss of appetite, and had fever, which his mother had noticed for several nights. Thermometric observations were not taken until the 20th. He went to bed on the 16th, and did not get up until the fourth of August. During the attack the symptoms were lassitude, slight headache, constipation, with very little tympanites, and considerable emaciation. There was no delirium; no rose spots, or other characteristic symptoms of typhoid fever. His evening temperatures from the 20th to the 31st inclusive (with the exception of the 22d and 28th, when no observation was recorded), being a period of twelve days, were as follows: 102.8°; 102.5°; 102°; 103.8°; 103.6; 102°; 103.2°; 102.8°; 102.4°; 100.8°; mean of high temperatures before remission 102.78°. The descent from the 31st was rapid, and on the evening of the 2d of August 98.4° was reached. The morning remissions were slight until the 28th, when 100.8° was registered. On August 1st there was no fever in the morning. Counting from the 16th (the first day when fever was observed), as his first day, the whole duration of the attack to the 2d August was 18 days. It may have been a few days longer than this. Convalescence was slow. During nearly the whole period of his illness he had a great desire for food, and never was without appetite, although the fever was at a high point for nearly two weeks.

CASE III. S. Y., æt. 9, brother of the last patient, remained in the house for the greater part of the time during his father's and brother's illness.

*August* 5. Fifteen days after beginning of his father's convalescence, and three days after the disappearance of his brother's fever, the second son was observed to be unwell; he had no appetite, with some fever in the evening. The minds of those in the house were so much occupied with the boy just entering upon convalescence, that no symptoms indicative of the prodromal period in this third patient were noticed. In the following table will be found a record of his temperature and pulse, with the progress of the case. He went to bed on August 6th, and observations were begun on the following day.

[1] If we assume July 9th to be the first day of the disease and the previous symptoms to have been prodromal, the whole duration of the attack was eleven days.

| Date. | Day of disease. | Temperature. | | Pulse. | | |
|---|---|---|---|---|---|---|
| | | M. | E. | M. | E. | |
| Aug. 7 | 2 | ..... | 102.5 | ... | 105 | Languor; debility; headache; pains in limbs; tongue white; constipation; slight tympanites; liquid food only. |
| " 8 | 3 | 101.9 | ..... | ... | ... | |
| " 9 | 4 | 102 | ..... | 114 | ... | |
| " 10 | 5 | ..... | 105 | ... | 118 | A teaspoonful of castor oil; no movem't. |
| " 11 | 6 | 102.8 | ..... | 118 | ... | Oil repeated; one stool, consistent. |
| " 12 | 7 | ..... | 103.9 | ... | 120 | Rose spots; no delirium; no enlarged spleen; slight tympanites. |
| " 13 | 8 | 101.8 | 102.1 | 119 | 114 | |
| " 14 | 9 | 101.4 | 102.4 | 104 | 114 | Oil again given; one movement. |
| " 15 | 10 | 101.3 | 102.4 | 104 | 108 | Sleeps well every night without sedatives. |
| " 16 | 11 | 100. | 101 | 108 | 104 | For the first time no appetite. |
| " 17 | 12 | 99.8 | 101.2 | 100 | 104 | No sensation of illness. |
| " 18 | 13 | 99. | 101.4 | 97 | 116 | |
| " 19 | 14 | 98.8 | 101.8 | 100 | 114 | |
| " 20 | 15 | 98.9 | 102.1 | 104 | 112 | Oil given with desired result. |
| " 21 | 16 | 98.9 | 101 | 112 | 100 | |
| " 22 | 17 | 98.1 | 100 | 100 | 108 | |
| " 23 | 18 | 97.9 | 100.1 | 98 | 98 | Appetite. |
| " 24 | 19 | 97.9 | 100.8 | 98 | 104 | |
| " 25 | 20 | 97.8 | 98.2 | 88 | 88 | Tongue losing fur; appetite great. |
| " 26 | 21 | 97.2 | 98.4 | 86 | 88 | Emaciation great. |
| " 27 } | 22 | 97.2 | 98.4 | 86 | 88 | No delay in convalescence after this date. |
| " 28 } | 23 | | | | | |

An opportunity was offered in this case of following the symptoms from the beginning to the end. With the exception of the rose spots and fever, the patient did not present any of the characteristic features of the disease. There were no nervous symptoms whatever except slight headache in the beginning; the bowels were only moved when oil was given. He did not feel ill, and was only kept in bed and on liquid diet by reiteration of injunctions and careful watching. The fever wave presents the characteristic evening exacerbations and morning remissions with the average duration of typhoid fever. The stage of ascent was finished on the fifth day; when the evening temperature reached 105°, its highest point. The fastigium was of the descending variety from the beginning; it ended on the 18th, lasting one week; mean of maximum temperatures 102.2°. Defervescence also occupied one week; normal morning and evening temperatures occurring first on the 25th. The whole duration of the fever was nineteen days. The study of the variations of the temperature pointed out the nature of the disease, and the necessity of rest and liquid diet in securing a steady and uninterrupted progress towards recovery.

CASE IV. Mrs. J., æt. 43, light mulatto, residing on the next block to the previous cases. In July, 1874, did not feel strong; went away from home into the country; returned in a few days. During the first week in August complained of headache, lassitude, loss of appetite, and diarrhœa. I saw her for the first time on August 7th. She had headache and was drowsy; the bowels had not been moved for two days, and there was tympanites. She remained in bed for twenty days from this date. The tongue was slightly furred throughout; the appetite was absent; the

bowels were persistently constipated, and only moved by a dose of castor oil every third night; the headache and drowsiness lasted one week; the tympanites was not marked after the end of the first week; there was no rose rash and no enlargement of the spleen; the fever lasted from the 7th until the 22d; the highest point reached was on the first day of observation, 102.8°; including this, the average evening temperature was 101.06°; average morning temperature 99° during the fastigium; defervescence began on the 14th and ended on the twenty-second. From the character of the symptoms previous to the 7th, and from the height of temperature on that day, the probabilities are that she was then in the fourth or fifth day of the attack; hence the whole duration of the illness was twenty or twenty-one days. The range of fever was lower than in either of the three preceding cases, and the symptoms still more negative, but the fever chart was positively diagnostic of typhoid fever.

CASE V. Mr. F., æt. 45; fever began August 8, 1873. Symptoms were slight, diarrhœa and tympanites in beginning; afterwards constipation; no nervous phenomena, no rose spots, no enlarged spleen; fever curve showed well defined periods of ascent; acme and descent lasting twenty-two days; the highest point was reached on the 20th and was 102.9°. The average evening rise was 102.1° during the height of the disease.

CASE VI. Mr. H., æt. 28. Prodromes for several days; went to bed August 8, 1872; complained of headache and debility; tongue furred; slight delirium during first few days; no tympanites; constipation; no rose spots; no enlarged spleen.

The fever passed through the successive periods of enteric fever from the 8th to the 29th. The mean evening rise during the fastigium was 101.8°; the highest point was 102°.

CASE VII. Mr. McC., æt. 33. October 17, 1872, began to feel lassitude and indisposition to attend to business. October 27, fever observed; went to bed, and remained there until November 12, twenty days. The tongue was only slightly coated, appetite unimpaired, and bowels constipated. A few rose spots; no enlargement of spleen; characteristic temperature chart of typhoid fever. Mean evening temperature during period of full development 101.2°; highest evening rise 101.8° on the fourth day of attack. Normal morning temperature reached fifteen days after going to bed; evening temperature normal three days later. The pulse was not over 100, averaging 90.

The following history exhibits a continued fever of much lower grade than any of the preceding:—

CASE VIII. Mrs. R., æt. 35; had a severe attack of enteric fever ten years ago; has been in moderately good health since. In the early part of August, 1874 (same period of first four cases) complained of debility, headache, pain in the back, loss of appetite, and thirst; bowels normal or constipated. I saw her two weeks later, on August 13. Her temperature was 99.6°, and pulse 98. From this date she remained in bed, with symptoms not very different from those above mentioned (only that constipation was persistent) for fifteen days. The evening high temperatures averaged 99.4°; morning temperatures 98.97°. The highest temperature was 99.6°. The decline of the fever was gradual, and convalescence much prolonged, the patient being unable to attend to her household duties until two weeks after leaving bed.

If this be a case of typhoid fever (and there seems no reason to doubt it, as it differs only from the others in having a lower fever wave), it fittingly closes this series of mild cases, being itself the mildest of them all. The prevailing epidemic, the long prodromic stage, tedious convalescence, and typical fever curve, favour the opinion formed.

The recognition of the nature of the malady was facilitated in the foregoing eight cases by questions of locality, season, age, and contagion. Three were in the same house; all were in the same part of the city, on a plateau at some elevation above the river level; five occurred in the latter part of the summer and autumn of 1874; two in autumn of 1872; one in August, 1873. Five of the patients were under thirty-six years of age; the youngest was nine; the oldest forty-five. Contagion in the first three seems highly probable. A long prodromal period was traced in four; headache occurred in three; tympanites in three; diarrhœa in two; rose spots in three; emaciation and tedious convalescence in all. The approximate duration of the fever in days was as follows: 18, 18, 17, 20, 21, 15, 18. An estimation of the temperature, to show the mean of the high points during the period of greatest rise, gives the following series: 102.78°. (Case II.); 102.3° (Case I.); 102.2° (Case III.); 102.1° (Case V.); 101.8° (Case VI.); 101.8° (Case IV.); 101.2° (Case VII.); 99.4° (Case VIII.). The relations of the stages of fever, the sequences of morning remissions and evening exacerbations, the final pictures of the temperature variations presented, like the children of a family, resemblances in form and feature which pointed to a common parentage.

No matter how such facts are interpreted, we must extend our views of typhoid fever beyond the area to which we limit it, and must include many continued fevers of sub-febrile course which are overlooked or classed under other heads. The prevailing opinion of the day finds its expression in the following limitation of the disease by Trousseau: "Every disease in which the temperature does not reach 103.10° F. by the evening of the fourth day is not typhoid fever." (*Clinique Médicale*, xv.—Dothiénentérie.) Such a definition cannot be absolute, and, although we may find it impossible to fix the minimum elevation of temperature in typhoid fever, yet it has a range below that which we suppose to be its lowest, where thermometric observation is alone able to determine the nature of the affection. At present, therefore, we find no answer to the question propounded, "What is the minimum state of symptom which warrants the diagnosis of typhoid fever?"

II. So far those forms only of typhoid fever have been considered in which the mildness of the attack is measured by a feeble manifestation of one or more of the symptoms of the disease. No marked distinction in length may exist between these and more severe cases.

The term "abortive typhoid" has been suggested by Lebert, to be applied to those cases which were first described by Griesinger, and since by

Wunderlich, Jürgensen, and others. An abortive typhoid, while it lasts a much shorter time, need not necessarily be mild. It usually is so from the start, and the fever of the second and third weeks (infiltration and ulceration, Peyer's patches) is much shortened, corresponding to the defervescent period of the third to fourth week in ordinary attacks. The percentage of the characteristic symptoms, according to Liebermeister, is less in the abortive forms—diarrhœa appearing in 41 per cent. (64 per cent. in all cases); roseola in 21 per cent. (76 per cent. in all cases); enlarged spleen in 71 per cent.

Murchison classes under the head of mild typhoid all those cases which end in the second or beginning of third week.

Jürgensen, of Tubingen, observed epidemics of abortive typhoid in Kiel, in 1865, '66, '68. His diagnosis was confirmed by post-mortem examination. In 74 out of 87 cases the onset was sudden, the temperature reached a high point, 104° F. early (in 34 hours), and not in the usual zigzag fashion. The fever lasted ten to sixteen days, and then declined rapidly, the normal temperature being reached in 24 to 72 hours. Swelling of the spleen occurred in 90 per cent., roseola in 75 per cent., diarrhœa in 16 per cent., and iliac tenderness in nearly all. Convalescence was very long, and relapses, from improper diet, frequent. The epidemics were in the autumn, from August to November, in persons from 15 to 30 years of age.

Jaccoud admits the existence of this form of enteric fever, and says it is characterized by its sudden onset, short duration, and rapid defervescence, which sometimes occurs as early as *the seventh day*. (*Int. Pathology*, vol. ii. pp. 184–5.)

If we admit the validity of these observations we must abandon all the ideas of fixity of type, with the trust in the slow development and defervescence as pathognomonic indications which the study of Wunderlich seemed to have established. Typhoid may present itself under various forms yet undiscovered, and may have many sub-varieties of the common type. And while, as yet, the minimum duration of the disease cannot be fixed at ten days or less, we are forced to form a new conception of its history, and look for its well-known symptoms in attacks which do not conform in length with our previous views.

The typhoid infective agent has a virulence which is by no means the same under all circumstances. The limits of variability are shown to be very wide. In the same house may exist cases which react in very different ways to an infection which seems to be the same. Different cities and countries probably present peculiarities, and it is for the future to determine in what these peculiarities consist. Our typhoid certainly differs from the European disease. Enlargement of the spleen has not, among us, the large percentage recorded abroad. Intestinal hemorrhage is very rare here, whereas it is said by Liebermeister to be very common. The

estimates by different writers of its frequency are as follows: Liebermeister, 1743 cases of typhoid fever, 127 cases of intestinal hemorrhage, 7.3 per cent.; Griesinger, 600 patients, hemorrhage in 32, 5.3 per cent.; Louis, 5.9 per cent.; Flint, 73 cases, hemorrhage in 3, 4.1 per cent. There is a difference of over 3 per cent. between the frequency of intestinal hemorrhage in Basle and in New York. In Edinburgh lung symptoms are said by Bennett to be most prominent. In Germany abdominal symptoms are most common. In Washington, diarrhœa, while frequent in severe cases, is by no means as usual in the milder cases as constipation. Climate and locality have much to do in establishing a prevailing type. In Basle the cases which are not severe are of the mild continued form, whereas in Kiel (Jürgensen) the abortive forms make up the bulk of the imperfect cases. (Liebermeister, *loc. cit.*, p. 121.) Among us the abortive form has never been observed, but mild attacks of three to four weeks' duration are seen every year.

These few suggestions suffice to show that before a science of differential diagnosis in typhoid fever is complete, local peculiarities must be studied and laws established which shall have local not universal application.

The important lesson which is taught by the observation of mild and abortive cases is, that there has been in the past, owing to the want of thermometric art, a failure to see in obscure cases of illness accompanied with slight fever their true and specific nature.

That errors in diagnosis were of frequent occurrence all authors admit, and that to-day we ascribe to other causes than the real one the ill-health of many of our patients must be equally granted. The febriculæ, the simple continued fever, the "anomalous fevers," the obscure malarial diseases, should be and are now to a great extent ranged under the head of enteric fever. Murchison (*op. cit.*, p. 587) believes febricula to be properly abortive typhoid. He also thinks insidious and latent attacks of typhoid fever are often called simple continued fever, bilious attacks, and gastric fever. Niemeyer (Art. *Abdominal Typhus*) speaks of many cases of mild typhoid being miscalled mucous and gastric fever. The disease for which, in Washington, typhoid fever is commonly mistaken, is remittent fever. The prevailing idea of the wide prevalence of a malarial influence is the cause of the error in question, and in cases where the symptoms are negative, and where the thermometer is not used, the error is almost unavoidable. In such forms the morning diminution in the pulse's frequency, with an apparent cooling of the body temperature, is apt to deceive; but a pulse of seventy or eighty may be accompanied with slight remission in the fever. In the infant "a considerable proportion of the cases of so-called remittent fever are cases of typhoid fever." Rilliet, Taupin, West, and others have admitted the same. The "bilious fever" of this neighbourhood is generally modified typhoid.

The neglect to place those suffering from the inconvenience of a slight

illness, if that illness be typhoid fever, under conditions favourable to a restoration to health, results in the evolution of higher and more dangerous forms. Typhus ambulatorius may be suggested in this connection as showing, according to Jürgensen (Liebermeister, *op. cit.*, p. 141), how undeveloped typhoid fever may be aggravated and protracted in its course by errors of diet and an improper mode of life. In the mild cases individuals often go about until the disease has advanced to its second week, and even beyond, before an observation of the temperature reveals the height of the fever. If we could get control always of our patient, as we sometimes do, during the prodromal stage, and guard carefully all those of a certain age, in certain seasons, and in times of epidemic influence, who complain of languor, headache, and disturbed digestion, we might meet less frequently with severe and fatal cases.

The idea once firmly fixed that a large number of those infected with the typhoid poison do not present the typical features of the disease, will inevitably lead to such a course of action as will greatly moderate or greatly shorten the successive phases of the malady.

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ART. V.—*On the Connection between Staphyloma Posticum and Astigmatism.* By WM. THOMSON, M.D., Lecturer on Diseases of the Eye and Ear at Jefferson Medical College, Surgeon to the Wills Ophthalmic Hospital, Philadelphia.

No apology will be needed for the discussion of the question of sclerotico-choroiditis posterior, since all ophthalmic surgeons regard it as second to no other in awakening all their solicitude as to the future of the patient, whose eye-ground presents to an ophthalmoscopic examination the characteristic brilliant white crescent at the margin of the opic nerve. Not only the future with its possible increasing myopia, vitreous opacities, posterior polar cataracts, retinal degenerations and separations, and consequent loss of sight, is to be considered, but the immediate needs of the case, the question of hygiene, the use of proper glasses, the loss perhaps of educational facilities, the antiphlogistic treatment, including local abstraction of blood, counter-irritation, prolonged use of atropia, or even mercurial impressions, all of which are regarded as essential by writers of the highest authority to combat a choroiditis, and which if unsuccessfully applied are properly regarded by the public as evidences of want of skill; and finally even the choice of a profession, trade, or other occupation, must all be duly weighed in assuming the responsibility of treating such cases.

For an extended discussion of the subject, with a full description of the appearances, I must refer the general reader to the well-known text-books,

and I would suggest that the lithographic plates of Jaeger, Liebreich, or those in the works of Wells or Stelwag, in which the appearances of the eye-ground are well depicted, should be examined in connection with these remarks. A very brief statement of the views at present entertained would seem to be needed as an introduction to the clinical facts now presented.

When one examines with the ophthalmoscope the fundus of a case of high myopia, the optic disk is seen perhaps elongated vertically, whilst horizontally there extends from its outer side a brilliant white crescent which may vary in size from a narrow arc on the side of the disk, to a zone surrounding it, but having a wide elliptical extension generally towards the macula, equal in breadth to two or more times the diameter of the disk. Its colour is brilliant white, from the reflection of light from the sclerotic surface, exposed by the disappearance of the pigment of the choroid; its margin is generally sharply defined and bounded by a line of pigment, small, irregular masses of which are sometimes seen scattered on its face. The large choroid vessels are very clearly seen against the white ground, and the vessels of the retina pass over it in clear view, but the small vessels of the choroid which give the fundus its rosy hue, and the pigment cells of the stroma, and the hexagonal cells also, seem to have disappeared.

In advanced cases complications are found consisting of numerous white spots scattered thickly over the whole eye-ground, and rude changes may be found in the macula lutea itself, which, Donders states, are almost constant after a certain period of life, and which are due to circumscribed atrophies of the choroid; or the vitreous humour may be found fluid, and rendered cloudy by numerous shreds or flakes of gray material visible to the observer. In more advanced cases these shreds are accompanied by a basket-like opacity at the posterior surface of the lens, or finally the retina may be seen partially detached from the choroid. In the uncomplicated cases the patient is usually highly near-sighted, has a low acuity of vision, finds it very difficult to do any near work with the eyes, with or without glasses, on account of pain and fatigue, complains of a dazzling sensation with his glasses on, has been using the eyes without them for reading, and has frequently insufficiency of the internal recti-muscles and perhaps a divergent squint, and chronic hyperæmia of the conjunctiva and tarsal borders of the lids.

The difficulties are already great enough, and if the observer believes, with Jaeger, that the appearances at the disk are congenital, he may content himself by alleviating the symptoms; but Donders has pointed out that if inherited, such eye-grounds should be found evenly distributed throughout the different classes of society, and not confined to those who use the eyes for near work; and Cohn, by examining the eyes of ten thousand children, establishes the law that myopia is infrequent in the infant schools, but that its percentage of cases, and its degree of defect, increase as child-

ren are subjected to the educational strain of prolonged reading of perhaps badly printed books in deficient illumination, until from a percentage of 1.5 in the village infant school it has increased in the university to 66 per cent. This appears to complete the chain, and to convince the surgeon that the case in hand was at one time, perhaps, free from myopia, that this has been induced first in a slight degree, and that by the gradual elongation of the eyeball, the degree has increased until the myopia may be when examined perhaps a $\frac{1}{6}$ or more, there may be a posterior sclerotico-choroiditis with some irritation and impairment of sight, but with the acceptance of these views, stares him in the face, the possibility of the further progression of the myopia, and the appearance in their turn, as time advances, of the various complications that clinical observation presents to us all, and perhaps the entire loss of useful vision from cataract, vitreous disorganization, hemorrhage into the eye, lesions at the macula or separation of the retina, at a time of life when the responsibilities of a family may be most urgent, and when many years of unhappiness may yet remain to the unfortunate patient.

As to the prognosis the books tell us to be "guarded," and as to treatment nothing at all adequate to the clear-cut peril is to be found. Careful attention to hygiene, rearrangment of school-rooms and furniture, avoidance of a constrained and stooping position, the use of tinted glasses, blisters occasionally behind the ears, derivatives acting upon the skin and kidneys, the use of bichloride of mercury and iodide of potassium internally, the absolute rest of the eyes and this enforced by daily use of atropia, and the douche, aided by occasional leeching of the temples, are the means proposed. As to glasses to remedy the myopia there is less clearness, Wells stating only that if patients use spectacles for reading, etc., they must be cautioned against holding the book too near to avoid a strain on the accommodation; their use for distance is not discussed in a hygienic manner, and there is a natural dread of giving advice which may be injurious.

In the translation of Donders' classical work, by the Sydenham Society, on page 353 will be found a full description and discussion of this condition, from which I will briefly extract some of his conclusions.

From examinations and recorded facts, with drawings of 700 myopic eyes of all ages and both sexes, he believes that "myopia and staphyloma posticum have become nearly synonymous;" the changes are atrophy of the choroid at the outside of the optic nerve entrance, change of form of the nerve surface, a straightened course of the retinal vessels, diffuse atrophies of the choroid elsewhere, and morbid changes at the yellow spot. They are depicted as crescents, with the concave side towards the nerve, or annular in form, or elliptical, the long axes extending in various directions, but generally towards the fovea, which, however, is *seldom reached*, but may present independent lesions. He confirms also the observation of

Liebreich, that the "nerve-surface has, in extensive atrophy, the greatest diameter in a direction perpendicular to the axis of the atrophy." He regards as belonging to the essence of myopia the choroiditis disseminata, recognized by its white spots, with irregular pigment deposits scattered over the eye-ground; the hemorrhages into the retina, and its detachment by blood or serum; the fluid vitreous, with movable flakes, and the partial opacity of the lens.

From the records of 1400 eyes he deduces that slight crescents are found in young persons, with low degrees of myopia, and that the size of the crescent increases with the age, and with the degree of the myopia, so that the largest staphylomata are found in old persons, who have the high degrees, and that they are preceded by a condition of hyperæmia. He gives Græfe's authority, who found in ten cases of high myopia, crescents in nine, and Jaeger's, who arrived at similar results, and then announces that we may go further and believe that "myopia depends upon a condition in which the development of atrophy is included." Nevertheless, he has seen atrophy without myopia, and twice in certain degrees of hypermetropia.

He also points out the extreme difficulty of the use of the erect method of ophthalmoscopic examination in high degrees of myopia, and states that his cases were observed by the inverted method only—a fact which may, perhaps, account for the presentation of these present views.

He offers a theory for the production of the crescent based upon the anatomy of the optic nerve, which is too profound and too extended for an abstract, to which the reader is referred, and believes that it begins as a separation of the outer from the inner sheath of the nerve, but offers no cause to account for this departure, beyond a "predisposition" to assume the elongation of axis characteristic of myopia. As to the elongation of the optic disk, perpendicular to the axis of the crescent, he says: "I can give no satisfactory explanation."

Are these the changes of inflammation of the choroid? Græfe assumed this position at first, but sought in vain for its characteristic changes in an eye which he was able to examine anatomically. Even with great attenuation of both sclerotic and choroid coats, Coccius, after examining the retina in many cases, found it also free from any serious change, beyond the loss here and there of some rods and cones. Donders concludes that there is a congenital predisposition to staphyloma, that it is developed with symptoms of irritation only in the moderate degrees, but that in advanced years, and in the high degrees, inflammation always occurs, but that we fail to find its products from the fact that they also have undergone an atrophic degeneration. He believes that its causes are a continued accommodation for near objects, a strong convergence, and a stooping position.

Giraud-Teulon has offered the following as his answer to the riddle:

In myopics, accommodation and convergence are employed to a greater degree than with emmetropics, and in undue convergence the external rectus and superior oblique in antagonizing the contraction of the internal rectus, have their points of insertion carried forward, and "in proportion to the degree of convergence, the globe, by reason of its shape, tends to stretch the oblique, an action that must manifestly be attended by an equal reaction on their part, thus increasing internal pressure. The simple physiological movement of convergence in a horizontal plane necessarily produces, therefore, a tendency to increased intra-ocular tension."

Two opposing theories for the production of staphyloma posticum are now held; the one that they are congenital; the other that the disappearance of the choroid and the sclerotic exposure, result from atrophy induced by inflammation, the latter being caused by a prolonged use of the ciliary muscle in preserving sustained accommodation, in overwork at a near point, causing a cramp or spasm of the ciliary, and a hyperæmia and inflammation of the choroid. Upon this theory myopia is regarded as not wholly due to an elongation of the ball, but to a contraction of the ciliary muscle and spasm of the accommodation, which may be successfully overcome by prolonged use of atropia; this has been preposed as a method of treatment, and several observers have published results which indicate that the myopia is thus reduced in degree, although their examinations are not confirmed by the ophthalmoscope in the erect method, and they fail to submit evidence that the reduction of the refraction is any greater than it would be from the use of atropia in normal or hypermetropic eyes, where its influence in this direction has already been pointed out by Donders.

Neither does it seem possible to believe that there can be any very severe strain upon the accommodation in myopia, since we know that many myopes read without glasses at their natural far points, and thus disturb their relative accommodation and induce insufficiency of the interni and divergent strabismus, by the efforts they must continually make to converge sufficiently to obtain binocular vision, whilst avoiding the increase of the refraction by any accommodation. Were cramp or prolonged use of the accommodation a sufficient cause for elongation of the eyeball and staphylomata, we would never see a case of high hypermetropia without such lesions, since uncorrected hypermetropes exist in the constant need for vigorous accommodation, and give themselves severe asthenopic symptoms, nervous and vascular, in their efforts to secure sharp definition, not only for near objects but also for distant ones, and do present evidences of cramp in the difference between latent and manifest hypermetropia. Moreover, Schnabel has tested the existence of spasm in two hundred and ten eyes, in eighty-nine the result after paralysis of accommodation by atropia being verified by the ophthalmoscope, and he has failed to dis-

cover spasm in a sufficient number of cases to satisfy him that it can be the influential factor in the elongation of the eyeball.

He allows that Dobrowolski found 69 cases of spasm in 110 examinations, and Hosch 46 in 67. Schiess reports 101 cases, and of these 51 in which the myopia depended upon cramp, glasses being used for the examination, and no report being made of the refraction by the ophthalmoscope; whilst in regard to the elongation of the disk at right angles to the long axis of the crescent, he says: "Ce c'est encore a savoir."

A valuable paper by Dr. Derby upon this subject may be found in the *Proceedings of the American Ophthalmological Society* for 1874.

Schnabel concludes that there are two forms of crescents: 1. The congenital, small in size, found in eyes of all varieties of refraction, where the choroid proper and epithelial layer are both absent, and analogous to choroidal coloboma. 2. The acquired, due to staphyloma posticum, resulting from a stretching of the choroid and its consequent atrophy.

With all these various theories, there remain a few pregnant clinical facts, viz., that myopia, with all its complications, is found in every walk of life, not only among the student-class, but also among the tillers of the soil, who have no daily need for enforced eye-strain; furthermore, we know but too well, from examination of school children, that this natural defect can be greatly increased by prolonged near work, and that its control is one of the most important duties of the ophthalmic surgeon.

My early experiences in treating high degrees of myopia were guided by the preceding views of Donders and Graefe; and the observation of the latter, that in 1000 cases of "amblyopia" he found 420 with staphyloma, induced me to rest satisfied with a low acuity of vision in my corrections, whilst I was led by Donders' view, that prolonged accommodation would increase the myopia, to give only a partial correction, and put the punctum remotum about 12 or 16 inches from the patient. Such glasses, whilst increasing the patient's comfort, yet failed frequently to relieve the severe asthenopia, and this led, in young people with vigorous power of accommodation, to the use of a fuller correction, to harmonize better the relation between accommodation and convergence; but the persistency of discomfort and the increase of the myopia in a few cases of children kept sufficiently long under observation, pointed to the inadequacy of hygienic precautions and spherical glasses, and led to a careful search for complicating astigmatism, the correction of which has proved sufficient to arrest the progressive myopia in the cases alluded to, and to remove in many others an asthenopia which prevented any useful work; glasses as high as $-\frac{1}{2}$, $-\frac{1}{10}$ cy. being needed, and giving entire relief, with $V=\frac{20}{XXX}$ in one case, $-\frac{1}{2}$ and $-\frac{1}{18}$ cy. in a second, and $-\frac{1}{1\frac{3}{4}}-\frac{1}{10}$ cy. in a third, and these persons have been entirely comfortable for more than two years.

So frequent is astigmatism as a complication, that I seldom see high myopia without it, and can give from my notes but a few cases; but they teach that when there is no astigmatism spherical glasses correct, give high acuity of vision, and enable the persons to use their eyes without fatigue. Such eyes finally rarely present staphylomata. For example, Miss M., with $-\frac{1}{8}$, $V=\frac{1}{1}$, no lesions whatever in either fundus.

Mr. R., age 50, distinguished lawyer, used glasses which gave p. r. of 20 inches for years; has no complaint to make, except that he does not see well for distance; found his myopia $\frac{1}{4}$, $V=\frac{15}{XX}$ with $-\frac{1}{4}$; eye-grounds both normal in every respect.

Mr. H., lawyer, uses eyes constantly. My. $-\frac{1}{4\frac{1}{2}}$, $V.\frac{15}{XIII.}$ No staphyloma. No astigmatism.

Miss A., age 25, $-\frac{1}{8}$ gives $V=\frac{15}{XVI.}$ No astigmatism; no asthenopia; no lesions in the eye-ground.

I infer from such cases that they are simply congenital, and that the degree of M. has never been any less, and that an absence of astigmatism enables them to enjoy a high acuity of vision with absence of choroidal changes, on the constant use of spherical glasses for *near work*. Nor is it more rare to find myopia without astigmatism than to see an optic nerve entrance which is perfectly normal in shape, and free from the evidence of strain or drag. Undoubtedly cases of myopia, high in degree, do present choroidal atrophies and changes at the disk or macula, when no glasses have been used for reading and other near work, and I have seen within a week a case in which M. was $\frac{1}{4}$, no glasses had been used in near work, but the macula in each eye presented circumscribed lesions with a central scotoma corresponding to them in the centre of each field. It is difficult in such a case to exclude astigmatism, and I have notes of several where the myopia was greater than $\frac{1}{3}$, with large crescents, but where the V. was too low to admit of accurate diagnosis by glasses, and where the ophthalmoscope also failed on account of the extreme difficulty of the erect method, combined with the fact that the refraction at the macula is frequently very much greater than at the disk.

I have before me now the clinical records of 100 cases of crescent at the optic nerve, which divide themselves into 80 cases of myopic and 20 of hypermetropic refraction, all complicated with astigmatism, in which, after a correction, and when viewed through it, the line of the drag or crescentic atrophy of the choroid has had a constant fixed relation to the axis of the required cylinder glass.

In our trial frames, looking at them from behind, the scale of the divided circle begins at the left-hand side, and increases towards the right, 1° being at the horizontal line to the left, and 180° being at a corre-

sponding point on the right side. Upon placing such trial frames on a patient's nose, it will be observed that this is reversed when we stand in front, and that 1° begins at our right, and increases towards the left, and that therefore 1° will be found at the patient's outer canthus for the left eye, and inner canthus for the right eye, and that the degrees will increase towards our left. In the diagnosis of these cases I have noted every sign of staphyloma upon this theory, and have depicted in note books the changes at the optic disk as they appear, by the erect method, to have a relation to the various degrees on our trial frames, when viewed through the correcting glasses.

The disk of an emmetropic eye, free from disease, will be found nearly round, its surface a plane having the same refraction as the surrounding fundus, and its retinal vessels should leave its porus opticus and proceed on their courses with a free and natural movement; when a physiological cup exists it is nearly round, and its borders are usually skirted by a minute vessel above and below.

In strong contrast with this are the disks of the patient D.; a man 30 years of age who had been using his eyes without glasses for hours each day at a near point, and who spent the evenings of the past winter in learning to draw; his symptoms were asthenopia, conjunctival hyperæmia, and partial loss of sight of right eye—$V = \frac{10}{cc}$; with the left he placed a book at ten inches, as his p. r., and could read only Snellen No. 3. Each disk was converted into a narrow ellipse with its long axis in the R. at 10°, and in the L. at 165°; and there extended downwards, in each eye, a large white staphyloma or crescent, the long axis of which was equal to three times the diameter of the narrow disk, and its direction at right angles to the long axis of the disk. The porus opticus was a narrow slit from which the vessels emerged as though the upper half of the disk had been drawn downwards; the upper vessels being lost to view at the sharp upper edge of the excavation, whilst the lower seemed to come from beneath an overhanging projection, which prevented the main artery and veins from being seen at the bottom of the cup. The upper half of the disk, between the edge of the excavation and its border, was a flat plane with a full pink colour; whilst the lower half seemed lost in the crescent, and its lower edge was marked by a faint blue tint. The refraction of the vessels in a line with the long axis of the disk was E., whilst of those in the long axis of the crescent it was M. $\frac{1}{18}$, they had lost all freedom in their courses, and were straightened as though submitted to tension in this direction.

In the Rt. there appeared numerous small round white atrophies of the choroid, limited to that part of the eye-ground in a line with the direction of the crescent, and extending over a space pyramidal in shape, which would have its base at the ora serrata, and its apex at the disk.

From the appearances near the fovea in Rt. and the low V. obtained by proper correction, the man was treated for some weeks with hydrarg. bichlorid. and potas. iodide, and when last seen he had been using—

Rt. $-\frac{1}{18}$ cy. ax. 100° $V = \frac{1}{4}$, having increased from $\frac{1}{20}$.
Lt. $-\frac{1}{18}$ cy. ax. 75° $V = \frac{1}{2}$; the asthenopia had disappeared.

With one emmetropic meridian this man, without glasses, under the combined convergence and accommodation needed for near work, had a p. r. of 10 in., and could only read No. 3 S. The situation of the disseminated atrophies suggested that the staphyloma and impaired nutrition of the choroid might, perhaps, be due to the same cause.

This series consists of eyes with myopia and astigmatism, in which the long axis or width of the crescents *coincided* with the axis of the cylinder, and most of these presented high degrees of M.; for example:—

E. $-\frac{1}{24}$ ⊃ $-\frac{1}{30}$ cy. ax. 60° R. $-\frac{1}{4}$ ⊃ $-\frac{1}{30}$ " " 150° Lt. $V=\frac{15}{XX}$.

Mr. P., age 64. Rt. $-\frac{1}{24}$ ⊃ $-\frac{1}{12}$ cy. ax. 115° Lt. $-\frac{1}{24}$ ⊃ $-\frac{1}{12}$ " " 90° $V\frac{10}{XL}$.

Mr. B., age 54. R. 90° $-\frac{1}{6}$ S. ⊃ $-\frac{1}{6}$ cy. ax. L. 90° $\frac{10}{XXX}$.

Miss H. R. $-\frac{1}{2}$ ⊃ $-\frac{1}{20}$ cy. ax. 180° $V\frac{\frac{20}{XXV}}{\frac{20}{XXX}}$ L. $-\frac{1}{24}$ $-\frac{1}{10}$ cy.

M. S. $-\frac{1}{8}$ ⊃ $-\frac{1}{10}$ cy ax. 90°.

Mrs. G. $-\frac{1}{4}$ ⊃ $-\frac{1}{20}$ cy. ax. 15°.

With spherical glasses there was very low acuity of vision and obstinate asthenopia, which yielded to the proper correction. Several cases presented lesions near the fovea and vitreous opacities, in persons over 50 years of age.

In another series of cases the axis of cylinder had to be placed at right angles to the line of drag at the disk or width of crescent, as in the eye of Miss S., 15 years old, who was two years ago provided with $-\frac{1}{6}$ sp. which gave with each eye $V=\frac{20}{XXX}$, but failed to relieve an asthenopia which prevented her from reading or sewing. A recent examination found her with $\frac{1}{9}$ in use, and $V$ reduced to $\frac{20}{LX}$, and the myopia increased. Each optic disk was an ellipse, with its long axis in Rt. at 160°, in Lt. 30°, and extending downwards at right angles to these directions, there was a large rounded crescent; the physiological cup was a slit overhung by the upper margin of the disk, from beneath which the large retinal vessels escaped. After careful correction she required—

Rt. $-\frac{1}{7}$ ⊃ $-\frac{1}{30}$ cy. ax. 160°
Lt. $-\frac{1}{7}$ ⊃ $-\frac{1}{30}$ cy. ax. 30° giving $V\frac{\frac{16}{XX}}{\frac{16}{XX}}$

and she was when last seen able to use her eyes with comfort.

Mrs. J., then 25, was corrected five years ago by the following—

Rt.— $\frac{1}{8} \bigcirc -\frac{1}{10}$ cy. ax. 1°
Lt.— $\frac{1}{10} \bigcirc -\frac{1}{10}$ cy. ax. 1°.

She had a history of myopia and asthenopia dating from childhood; had been educated by being read to by a companion, and had been told by surgeons of repute, who were misled by the appearances of her disk by the inverted method, that there was partial atrophy of the nerve, and that total blindness might ensue at any time. Since the use of proper glasses she suffers no fatigue in prolonged near work, the eyes are free from irritation, there has been no change in the refraction, and her satisfaction is as lively as it was at first. Each disk presents a white crescent extending upward, with the dragged appearance of the vessels, which escape from beneath the lower half of the disk—details which can be readily studied by the erect method through her correction.

In the next five cases there are staphylomata in one eye only, combined with astigmatism, the other being Em., or myopic only, and free from crescents.

Miss P. Rt.— $\frac{1}{4}$ $V\frac{18}{XX}$, normal fundus.
Lt.— $\frac{1}{7} - \bigcirc \frac{1}{10}$ ax. 40°, crescent down and out.

Mrs. D. Rt.— $\frac{1}{14} \bigcirc -\frac{1}{12}$ cy. ax. 10° $V\frac{20}{XXX}$, crescent downwards.
Lt.— Em. $V\frac{1}{7}$, normal fundus.

Mrs. V. Rt.—Em. $V\frac{1}{7}$, normal fundus.
Lt.—Sphero-cylind ax. 100°, crescent upward.

Mr. F. Rt.— $\frac{1}{10} \bigcirc -\frac{1}{20}$ cy. ax. 165°, $V\frac{20}{XXV}$, crescent down and outward, in direction of 75°.
Lt.—Em. $V\frac{1}{7}$, normal fundus.

Mr. B. Rt.— $\frac{1}{7} \bigcirc -\frac{1}{16}$ cy. ax. 75°, crescent up in line with axis of cy. $V=\frac{20}{XXV}$.
Lt.— $\frac{1}{11}$ $V=\frac{20}{XXV}$, no crescent.

These cases suggest strongly that astigmatism, and not myopia, is coincident with staphyloma.

That crescents exist without myopia is shown by a series of 20 eyes, in which the refraction was hypermetropic, two of which will be given for illustration.

Miss I., age 50; sight always imperfect; uses a strong convex ($+\frac{1}{3}$) as a hand glass for near vision. One meridian Em., the other hypermetropic. Acuity of vision brought in each eye to $\frac{20}{XXX}$ by $+\frac{1}{8}$ cy. ax. 90°; without correction $V=\frac{10}{C}=\frac{1}{10}$; each eye presents a large white cres-

cent extending down from lower margin of disk, coinciding with axis of cylinder.

Mrs. M., age 48. $V\frac{\text{Rt.}}{\text{Lt.}}\frac{10}{\text{LXXX}}=\frac{1}{8}$, with constant headache. The disks are precisely like those above described, and the formula required for correction was—

$$\frac{\text{Rt.}}{\text{Lt.}}+\tfrac{1}{48}\text{ S.}\supset+\tfrac{1}{10}\text{ cy. ax. }\begin{matrix}100^\circ\\90^\circ\end{matrix}V=\frac{20}{\text{XL}}.$$

Mr. D. Asthenopia, under atropia $V=\frac{10}{\text{C}}=\frac{1}{10}$.

$$\text{Rt.}+\tfrac{1}{10}\text{ cy. ax. }120^\circ\,V\frac{20}{\text{XXX}}.$$

$$\text{Lt.}+\tfrac{1}{30}\supset+\tfrac{1}{12}\text{ cy. ax. }120^\circ\,V\frac{20}{\text{XXX}}.$$

There is a crescent at each disk, its width coinciding with axis of cy. in the left down and out, in right down and in, and *away from fovea.*

The exceptions, as in the following marked cases of astigmatism, where there were no staphylomata, are most interesting, and suggest that binocular vision, which was absent, is to be considered as essential in the problem.

Miss L. A. and hy. $=\frac{1}{12}$ in each eye; convergent squint with absence of crescents.

Mr. S. Rt. Amblyopic.
Lt. $+\frac{1}{8}\supset+\frac{1}{16}$ cy. ax. 160, no crescent.

Mr. P. $\left.\begin{matrix}\text{Rt.}-\frac{1}{24}\supset-\frac{1}{16}\text{ cy.}\\\text{Lt.}-\frac{1}{14}\text{ cy.}\end{matrix}\right\}$ ax. 180 $V\frac{15}{\text{XX}}$, divergent squint, no crescent.

Mrs. A. Divergent squint, with hy. and astigm., free from crescents.

Dr. W., $\begin{matrix}\text{Rt}-\frac{1}{11}\text{ cy. ax. }110^\circ\\\text{Lt.}-\frac{1}{20}\text{ cy. ax. }180^\circ\end{matrix}V\,20\,\frac{\text{XX}}{\text{XX}}$, has been a hard student, but presents disks free from crescents, reads entirely with left eye.

In all these various cases the extent of the changes at the disk was in proportion to the degree of optical defect, a low degree of A. being marked by a displacement of the excavation and the vessels, with a narrow crescent involving, perhaps, only the hexagonal cells; whilst high degrees were combined with large white crescents, straightened vessels, an elliptical shape of the disk, and a dragged condition of that part of the disk where it passed into the staphyloma, where the refraction by the erect method was greater than the remainder.

Having endeavoured to point out the clinical fact that there is a coincidence between the direction of a staphyloma posticum and the astigmatic meridian of the cornea, I approach the attempt at explanation with extreme caution, and trust that the importance of the subject may induce others to aid in its entire solution.

These crescents are either congenital or induced. If the former is accepted, we must rest content with the practical value of these observations in aiding the diagnosis and correction of astigmatism; we will then also believe that congenital crescents are the companions of congenital asymmetrical corneæ, and that we need feel no alarm on their account when we meet them in patients, say of twenty years of age, in whom they have existed since birth; but if we fear that they may increase, however, and be attended by other morbid changes well known to the observer, it becomes our duty to search for the causes which can hasten these sad results with as much care as if we believed that they could induce them. The weight of authority at present is in favour of ascribing the changes which attend progressive myopia, in which staphyloma is most common, to a prolonged strain of the accommodation in overwork, and hence its lesions are regarded as thus induced, if not in all, at least in those cases which have a congenital predisposition. Helmholtz and Donders have established that, when the eye is accommodated for a near point, the curvature of both surfaces of the lens is increased, and that this is caused by the action of the ciliary muscle, animated by the 3d pair of nerves, which they believe relaxes the zone of Zinn, and permits the lens, by an inherent elasticity, to increase its convexity, and hence its refraction. The iris was believed to exert a pressure upon the periphery of the lens, and to be an important factor, until by a clinical observation Graefe proved that accommodation remained after its entire removal. A serious objection to the prevalent view that the lens gains its convexity, upon the relaxation of the zonula, by its inherent elasticity, is that the lens must be, therefore, held in check, as it were, by the ciliary; hence it becomes impossible for us to believe, as we certainly do, that the adjustment of an eye for its p. r. is the state of entire muscular rest, since, under this reasoning, the use of distant sight would be a state of tension in which the lens would be repressed, but ready to spring into action on the relaxation of the zone. The authority of these two immortal observers renders it difficult to discuss their conclusions; but Helmholtz says, in closing his discussion of the subject, that whilst he considers this opinion the most reasonable, it has but the character of probability; and they would be the first to hail with welcome any facts which future clinical observation might offer.

Prof. Iwanof, in Stricker's Manual of Histology (vol. iii. p. 299), gives three admirable representations of the ciliary region of the eye in man, with description of the parts. The choroid, he says,

"is firmly attached to the sclerotic in two places: posteriorly, at the point of entrance of the optic nerve, where its inner layers are continuous with a ring that embraces the nerve, and from which fine fibres are given off which penetrate the nerve itself; and anteriorly, at the point of transition of the sclerotic into the cornea (annular tendon of the ciliary muscle)."

The ciliary muscle is imbedded in the anterior portion of the choroid, and consists in its greatest thickness of smooth muscular fibres, having

their attachments through the annular tendon to the tissue of the cornea, and arranged in a radiating or longitudinal direction, the fasciculi of which can be traced for a considerable distance backward in the choroid; the anterior and internal portion of the muscle is composed of circular fibres, the so-called annular muscle of Müller. He says, further, that the relative development of the meridianal and circular fibres is subject to variation, and depends upon the length of the optic axis; that in hypermetropes the annular portion is largely developed, whilst in myopes these fibres are very feeble, and the muscle consists chiefly of radiating fasciculi; and he gives drawings of the microscopic appearances of sections through the ciliary regions of an emmetropic, a hypermetropic, and a myopic eye, which sustain his views.

If we grant these anatomical facts we can construct a theory for the relation between staphyloma and the asymmetry of the cornea, which produces astigmatism, and gain moreover a further insight into the much disputed point of the accommodation. Henke has already proposed the theory that both positive and negative accommodation exist, and are caused by the contraction of the circular and radiating fibres, but he failed to offer proofs sufficient to convince Helmholtz, who pronounces against his hypothesis. Yet it seems requisite that we should possess some muscular power competent to overmaster the positive accommodation, and enable us promptly to adjust our eyes from near to far points. Could it be shown that the radiating fibres have attachments at the cornea and optic nerve entrance through the choroid, and thus resemble the string of a bow, whilst the circular fibres by their contraction could exert a tension similar to that used by the hand in discharging an arrow, it would be evident that such forces could exert a direct antagonistic influence upon the lens through their attachments by the zonula to its capsule.

The demonstration of an independent nerve supply for the circular and radiating fibres would render this theory yet more certain, and I will give evidence hereafter, to suggest that the radiating fibres, like those of the iris, are under the control of the sympathetic system. To show the influence of such power of negative accommodation in causing structural changes, let us suppose a case of myopia, say $\frac{1}{8}$ in each eye, and that the person endeavours to read without glasses; it would be possible to do so at 8″ by suppressing all positive accommodation, and preserving binocular vision by the proper convergence. Should any + accommodation be used, the refraction of the eyes would be increased, convergence would likewise have to be made for a point nearer than 8 inches, and there would come an effort on the part of the patient to suppress the circular fibres, and put into strong tension the radiating fibres of the muscle which would then exert an injurious tension upon the choroid.

When, however, we add astigmatism, the following chain of incidents is possible. Take a case of an emmetropic meridian, for lines at 1°, and a myopic one of $\frac{1}{18}$ for 90°; the patient is hence able to see horizontal lines

at infinity, but has a p. proximum for vertical ones of 16″; when he regards, of two cross lines, the one at 1°, placing it at 16″ away, he must put on + accommodation of $\frac{1}{16}$, and by this he puts the p. r. of his myopic meridian at 8″, and should he then crave to see the line at 90° he would be obliged either to bring it to 8″, or he would relax the + accommodation, and view it with his myopic meridian, with suppressed accommodation; combine two such eyes, in binocular vision, and the theory of *relative* accommodation would enter into the problem, and make their muscular movements still more intricate. Furthermore, in reading the acuity is diminished by the astigmatism, and the patient brings ordinary type much nearer than an emmetrope would do to increase its size, and the above supposed astigmatic would not be able to read a larger type than Sn. 3 at 10″ or 12″, and he would probably be found holding his page even within that point. We would then have the emmetropic meridians increased by relative accommodation, and myopic ones of yet higher refraction, engaged in the hopeless task, by constant struggles between the circular and radiating ciliary fibres, of transmitting to the retina the perfect images of objects, the vertical and horizontal parts of which would be, for such eyes, in a state of perspective. Grant the hypertrophy from constant use of the radiating fibres described by Iwanof in myopia, the two eyes cramped in a high convergence with its inseparable + accommodation, to preserve binocular near vision, and we can conceive that any persistent efforts at negative accommodation to reduce the refraction of the most defective meridians, might by tension on the choroid produce the signs of a dragged or displaced condition of the disk, or impair its nutrition so as to cause the atrophies of its stroma which present themselves in choroiditis disseminata; and finally that the line of displacement might have a connection with the unchanging astigmatic meridian of the cornea.

If we assume that the radiating fibres are under the nervous influence of the sympathetic, we can not only comprehend the distortion of the eye-ground, but the extreme asthenopia that is found in astigmatism. We have also a better conception of the influence of mydriatics and myotics.

Donders teaches that atropia dilates the pupil by paralysis of the circular fibres of the iris, animated by the oculomotorius, and by a partial stimulation of the radiating ones. If this influence is a paralyzing one upon the third pair, ptosis and strabismus should result from large doses. Again, in central or other paralysis of the third pair, we find accommodation annulled and the pupil partly dilated, but capable of further dilatation with atropia, showing its power of stimulation upon the nerve of the sympathetic. The muscular fibre cannot be the tissue affected, or both radiating and circular fibres would suffer alike.

I have carefully observed a few cases of pathological myosis, dependent upon central nervous disease, with the hope that I might find with the

contracted pupil a spasm of accommodation and apparent myopia, which would convince me that the ciliary muscle participated in the lesion of the sympathetic, which had caused the paresis of the dilators of the iris, but all my cases were old men, and there was also atrophy of the optic nerve, slight or severe enough to prevent any examination as to the condition of the accommodation. Such inquiry can only be made in clinical cases, and we fortunately have one recently reported by Dr. Reuling, of Baltimore, in the last number of *Arch. of Ophthalmology and Otology*, where myosis was caused by a gunshot wound of the cervical portion of the sympathetic. The pupil was small, and would contract no more with Calabar bean; $V=\frac{20}{\infty}$, but with $-\frac{1}{18}$ $V=\frac{20}{xx}$; a spasm of the accommodation was proved by the influence of atropia, which dilated the pupil, and reduced the refraction to $-\frac{1}{4}\frac{1}{9}$, where it remained, affording us a numerical estimate of the muscular tonus dependent upon integrity of the sympathetic, which might be even higher, since, from the character of the lesion, some paresis might have yet remained after treatment.

Binocular vision seems to be a condition requisite for this kind of staphyloma, since my note-books contain numerous cases where astigmatism was found in high degrees, myopic or hypermetropic, without lesions at the disk, when one eye only had been habitually used.

Most of the cases reported have sought advice for symptoms of asthenopia, complicated with persistent forms of conjunctivitis and blepharitis, which have always hitherto seemed out of proportion to the optical defects. The vigilant, unceasing muscular adjustments that may be needed to permit people with even low degrees of astigmatism to sew or read, may be sufficient to cause such symptoms of irritation.

We are also provided with a trustworthy test for astigmatism in the observation of any signs of drag, even slight, that can be seen at the disk, and I constantly use these hints to determine not only its presence, but its meridian. How important these studies are, in a hygienic point of view, may be perceived when we consider the hundreds of thousands of dollars spent in school furniture since attention has been called to increasing optical defects in school children, and when we consider that no change of chair or desk can be of any service to an asymmetric cornea, in comparison with the cylindrical glass which will harmonize the refraction, and permit the muscles of accommodation and convergence to do their work with ease, as in emmetropia.

ART. VI.—*On Cold as a Cause of Acute Inflammation.* By A. F. A. KING, M.D., of Washington, D. C., Prof. of Obstetrics and Diseases of Women in the National Medical College, and in the University of Vermont; one of the attending physicians to Providence Hospital, Washington, D. C.

WHEN, after being chilled by exposure to cold, an individual suffers an immediate attack of acute congestion or inflammation (no matter of what organ), it is easy to infer, as is commonly done, that the "taking cold" produced the inflammatory attack. Thus, it is universally admitted that "*cold is an exciting cause of acute inflammation.*" In part, this is true; but it is only half the truth. Of two persons similarly exposed, one shall suffer nothing. There must therefore be present in the individual who is attacked some pre-existing condition, which entails upon him the *liability* to inflammation after exposure. And, further, since of several persons who thus suffer from acute inflammation, different *organs* may be attacked in each, it is evident there exists in the organs inflamed some pre-existing condition creating the liability to inflammation, and which does not exist in the organs that escape. Thus we are at once brought to acknowledge that cold, *per se*, is *not* a cause of acute inflammation; and it therefore becomes of great importance to ascertain what are the pre-existing conditions that create the liability to inflammation on exposure, and, in the absence of which, the inflammatory attack would not have occurred.

To define these (some of them) is the purpose of the present paper. And first let it be premised that I do not intend here to deal with such intense degrees of cold as produce frost-bite and the fatal torpor experienced by Arctic voyagers, etc. It ought, further, to be noted, also, that the frequency with which inflammation occurs is not so much in accord with a great *degree* of cold, as it is with *sudden depressions* of temperature, such as occur quite frequently during our winter season, or with sudden cooling of the body, during warmer seasons, from exposure to rain, and draughts of air, or from change of clothing, etc.

Of the bodily conditions that predispose to inflammatory attacks under such circumstances, we may mention:

*First. Rapid Physiological Evolution.* Children and young animals, though in quite a normal state, are peculiarly liable to congestion and inflammation on being exposed to cold, and hence with scrupulous care nature surrounds the young and growing progeny of all wild animals with the conditions that promote warmth; and the mother, in the case of the human species, takes the same precaution with her infant. That the condition of developmental growth is here the potent factor in predisposing to inflammation after exposure, is proved by the fact that the organs

whose rate of development is at the time most rapid have the predisposition most marked. Thus, the child is more liable to inflammatory affections of the digestive and respiratory systems, than it is to those of the reproductive organs. On the other hand, later in life, as at puberty, the liability to inflammation of the reproductive system, on exposure, becomes very manifest. The buds of plants that have not yet entered upon their vernal growth withstand the frost, but those that, owing perhaps to a warm southern exposure, have begun to develop earlier, are killed by the first cold night. Eggs that have not begun embryonic development can withstand a degree of cold that would be fatal to the embryo after the developmental process has been set in action by the warmth of incubation. The increased mortality among young animals and infants during unusually cold seasons, especially if the winter has been prolonged to the breeding season, and accompanied with sudden vascillations of temperature, is well known. And there is no other way of accounting for this augmented mortality than that congestion and inflammation of some of the internal organs has occurred, and which, in the human species at least, we know to be the case.

*Second.* Inflammation following cold is peculiarly liable to occur in organisms that are undergoing *pathological evolution*, and especially in the particular organs which are the seat of more decided or rapid pathological development.

Before presenting evidence in support of this proposition, it is necessary to define what I mean by the term "*pathological evolution.*" It will at once be surmised that the expression is meant to imply something analogous with *physiological* evolution. Such exactly is my meaning. As the normal development of a young organism is designed to secure the formation of certain structures, or organs, whose function, both in kind and degree, shall be such as to maintain a perfect adaptation between the organism and its natural environing conditions; so there also occur in the body other structural changes designed to secure a conservative modification both of structure and function, so that the organs thus modified may be adapted to other and *un*natural environing conditions to which the body has been subjected. These changes of structure I call processes of "pathological evolution." The causes that lead to them are the changes of environment just referred to. They are analogous with physiological developmental processes not only in the particular just mentioned, of securing adaptation, but also in being *gradual* in their formation; *latent* as regards symptoms; subservient in their growth to a given *type;* and in being disastrously interfered with in their evolution by the same disturbing causes that interrupt physiological growth, and prominent among which latter must be mentioned *exposure of the body to sudden depressions of temperature*, as I may now proceed to demonstrate.

With persons in whom some chronic structural disease is *known* to

exist, such as of the lungs, kidneys, stomach, etc., it is a common enough event for them to suffer acute inflammation of the affected organ, and to be finally "cut off" by such an attack, after exposure to cold. We constantly caution such persons to wrap up warm, and "take care of themselves," well knowing that if chilled, they are liable to congestion and inflammation of the chronically diseased organ. The frequency with which acute catarrhs and pneumonias thus terminate old cases of pulmonary disease is familiar enough; and so with other diseases. Chronic "invalids," for so we are wont to call such individuals, exhibit the same instinctive dread of cold as is observed in children and young animals, and the same liability to be easily chilled.

I have now to add that *unknown* structural diseases, viz: *latent, typical, gradual, pathological, evolutionary* changes, entail the same liability to inflammation on exposure, and in the absence of which (if we except other predisposing causes of inflammation presently to be mentioned), the inflammatory action would not occur. If this be true, it is of vast importance, inasmuch as the heretofore acknowledged frequent occurrence of acute inflammation in a previously perfectly healthy organ would be proved to be an error of no small magnitude. Furthermore, in the absence of the more usual evidence of chronic structural disease, the occurrence of inflammation would itself constitute a partial proof that such latent structural disease did really exist. There can be no doubt that many of the structural changes discovered after death, in organs that have just previously been acutely inflamed, are not at all due to the acute inflammation, but on the contrary preceded it and constituted the local condition predisposing to the inflammatory attack; this, too, notwithstanding the patient may have enjoyed good health, and have been free from any unpleasant symptoms directing attention to the altered organ. All this is easy enough of explanation when we recognize the fact that such designedly conservative processes of "pathological evolution," when pursuing their typical course undisturbed, are often completely *latent*. In no set of organs, perhaps, has the mistake of attributing post-mortem appearances to inflammation that ought not to be so attributed, been more prevalent than in those of respiration; and our entire pathology of phthisis and its kindred affections has been warped from the truth by this unfortunate error.

It is now very well known, however, since the researches of Handfield Jones, and others, that thickening and adhesions of the pleura, connective-tissue—hyperplasia, and consequent induration of the lung, and fibrous growths round the walls of the bronchi (peri-bronchitis), all of which, when found after death following acute inflammation, were thought at one time to be products of inflammation, are not always to be so accounted for, but very frequently occur slowly and latently without being suspected

either by the patient or physician, and quite independent of inflammatory action.

True, it is frequently alleged that a patient, whose lungs were examined yesterday and presented no physical sign of latent or other disease, will to-morrow, perhaps, on being exposed to cold, suffer from acute pneumonia or pleurisy. Thus, it is believed, the inflammation attacked a perfectly healthy organ. From this I demur. If the individual had been perfectly well before exposure, why should he afterward be ill, while his companions escape; and if his lung had been previously sound, why should it now be inflamed, while other organs in the body have escaped inflammation? Evidently there was something wrong about the organ before the patient was exposed.

To say that physical examination revealed no signs of structural change before exposure is not sufficient. *It is impossible by any yet known means of physical examination to detect the beginning of disease in the thoracic organs; more likely it is only the very prodigious structural changes that are thus recognized.* To illustrate, let us suppose a case of chronic interstitial pneumonia, of incipient "fibroid phthisis," so-called, or "cirrhosis," a disease of very common occurrence, though formerly not so considered. This is acknowledged to be a very insidious affection, gradual in its development, and often quite latent. It consists chiefly in obliteration of the minute capillary vessels covering the respiratory surface of the lung, and in their substitution by hyperplasied connective tissue; in time all the normal structures of the affected part are supplanted in a greater or less degree by the same sort of fibroid growth. Can we detect the incipient or secondary stages of the affection, or, indeed, any other than what are in reality its later stages? I think not. Excluding adventitious sounds, râles, which would hardly be present in the beginning, certainly not in the absence of catarrh, there remain chiefly changes in the respiratory murmur and in the percussion resonance from which we should have to judge as to the existence or non-existence of disease. Experts in auscultation and percussion do not usually recognize more than three or four well-defined shades or degrees of modification in the normal resonance and normal murmur, although, practically, we all appreciate a certain number of intermediate or sub-grades of modification. Thus the percussion resonance is said to be "clear," "dull," or "flat," and the respiratory murmur "increased," "normal," "feeble," or "absent." If we could reduce the different grades of deviation in the resonance and respiratory murmur to an exact scale, it is questionable whether ever so acute and well-educated an ear could appreciate more than ten well-defined degrees of modification between health and the most exaggerated physical abnormity. That is to say, if the lung sounds in one individual were just normal, and those of another abnormal, in some degree less than one-tenth

the abnormity in the latter case would scarcely be recognized with any certainty.

Returning now to our case of chronic interstitial pneumonia, let us suppose it has progressed to a sufficient degree to have obliterated and substituted by proliferated connective tissue *one square foot* of the rete of capillaries spread out over the respiratory surface; but this not in one spot, but diffused with tolerable equality over one lung. To have accomplished this thousands of capillaries and hundreds of air-vesicles must have been obliterated. Yet we cannot suppose that any so limited a change would be appreciable to the ear, for since, as the physiologist tells us, the normal respiratory surface in a full grown lung, if spread out, would cover seven hundred square feet (1400 *for both* lungs) we should have to recognize that the normal sound had been modified in a *one-seven-hundredth degree*. Even if the one square foot of obliterated surface were confined to one-seventh of the entire lung (the apex), instead of being diffused through the whole organ, we should still have to appreciate that the sound at the apex had swerved from the normal standard only in a *one-hundredth* degree. If, instead of one square foot, the extent of surface had been reduced by disease *ten square feet*, provided the abnormity were moderately diffused, it would still demand that we should recognize a departure from the normal sounds in a *one-seventieth* degree before the structural change could be diagnosed, yet here millions of capillaries and thousands of air-vesicles have been obliterated.

Nay, even if *fifty square feet* of the respiratory surface had been supplanted by connective tissue, provided the change were diffused, it is questionable whether the ear of every auscultator could recognize this prodigious abnormity, for it would require the recognition of a deviation from the normal sound only in a *one-fourteenth* degree.

Furthermore, when we reflect that the chest-walls in different localities and in different subjects vary from half an inch to an inch and a half or more in thickness, and that there exist in individuals that we acknowledge to be in perfect health certain variations in the size and shape of the thoracic cavity, and certain individual peculiarities in the size and functional capacity of the thoracic organs, it may justly be questioned whether these variations would not elicit more decided difference in the physical signs than could be produced by such limited organic changes as those just referred to as belonging to incipient chronic pneumonitis.

Of course, the same remarks apply with equal force to all other slowly-developing thoracic diseases.

Again, admitting a patient, whose lungs on recent physical examination have been pronounced healthy, to die shortly afterward with an acute pneumonia, and allowing that, on post-mortem examination, no evidence of previous structural disease of older date can be discovered, *there yet remains the doubt whether such previous structural change did not really*

*exist;* for, aside from its being obscured by the products of acute inflammation, and even allowing the possibility of eliminating this source of obscurity, it is still questionable whether the limited modifications of structure, common to latent chronic pneumonia in its incipient and secondary stages, could be recognized by the ordinary *ma*croscopical method of conducting necropsies; for it would require that modifications in the physical properties of the lung—in its colour, weight, density, elasticity, friability, etc. etc., from which examiners usually judge of abnormities—should be recognized when present only in a *one-seven-hundredth*, *one-hundredth*, *one-seventieth*, or *one-fourteenth* degree, respectively, for the several grades of pathological modification just mentioned when speaking of physical signs. Without *mi*croscopical examination they would most likely escape detection.

For the present, therefore, it certainly remains insufficiently proved that acute inflammation, after exposure to cold, can occur without the inflamed organ having been previously the seat of structural disease, or rapid growth, except under certain circumstances that constitute additional predisposing causes of inflammation on exposure now to be mentioned.

*Third.* Organs, previously quite healthy, but which have been subjected to violent, or too greatly prolonged functional exercise, especially if unaccustomed to such functional exertion, are liable to congestion and acute inflammation when the individual is soon afterwards exposed to cold.

This proposition is too evident to require much argument in its support. Exaggerated functional use is itself often sufficient to produce inflammation, but the addition of exposure to cold greatly enhances the liability to the acute attack, or increases its severity when it would have occurred without exposure. Acute inflammations having this origin must be familiar to every practitioner. I would only here add that the exalted nutrition consequent upon exalted function is in many particulars analogous with that belonging to physiological and pathological evolution.

*Fourth.* Organs are more than usually liable to acute inflammation on exposure to cold, *when they have been subjected to mechanical or chemical injury.*

And here, again, are going on processes of repair, in some sense analogous with physiological development, pathological evolution, and the exalted nutrition that follows exaltation of function.

In conclusion, it must be remarked that two or more of the above-mentioned predisposing conditions may be combined, when, of course, the liability to inflammation will be increased. Moreover, the existence of one of them creates a diminished toleration of the rest. Organs, for instance, undergoing physiological development, or pathological evolution, are thereby rendered less tolerant of exaggerated functional exercise, and of chemical or mechanical injury, and *vice versâ*.

From what has now been said, and remembering that certain individuals withstand almost any amount of exposure without injury, it may, I think, fairly be admitted that cold, *per se*, does not produce acute inflammation.

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ART. VII.—*Three Cases of Penetrating Gunshot Wound of the Thorax, with Perforation of Lungs; Recovery.* By B. J. D. IRWIN, M.D., Surgeon and Bvt. Colonel, U. S. Army.

DURING the early part of the war waged between the United States and the *soi-disant* Confederate States of America, much valuable material pertaining to the surgical and medical history of the contending armies was rendered unavailable or utterly lost to science through various adverse circumstances that surrounded the hastily improvised armies of both sections. Prominent among the causes that interfered with the keeping and preservation of perfect records of all cases of injury and disease was the pernicious system that permitted vast numbers of invalid officers and soldiers to straggle away, with or without authority, from under the control of the medical department of the army, to receive professional care outside of the established military hospitals. If the histories of the sick and wounded of the armies of the North and especially those of the South who were never treated at their individual homes, hotels, boarding-houses, and other private places, could have been preserved, collated, and added to the statistical tables embraced in the "Medical and Surgical History of the War of the Rebellion," the inestimable value of this peerless work would be rendered still more precious by presenting deductions fortified by an increased array of illustrative examples.

Some of the information rendered inaccessible through the vicious cause adverted to may be recovered from time to time by individual efforts. As an evidence of this the following instances of severe gunshot injuries are submitted, the cases not having been heretofore reported in detail in the official returns made at the time, owing to the fact that the patients were treated at their homes or in private quarters.

CASE I. *Penetrating gunshot wound of thorax and abdomen, perforation of the lungs, diaphragm, and liver; recovery.*—Lieutenant F. P. James, Third U. S. cavalry, aged 23, of active habits and good constitution, while in charge of a party of skirmishers October 11, 1863, at Collinsville, Tennessee, was wounded in the following manner: Lying in the prone position he cautiously raised his head and chest to enable him to peer over the crest of the ground in his front, and while so doing was wounded by a rifle ball. The missile struck the anterior aspect of the right side of the thorax at a point three inches outside of the sternum, passed inwards and downwards, in a line with the position of the body at the moment, between the fourth and fifth ribs, impinging on and shattering

the latter, thence downward, penetrating the pleura and grooving the lung, through the diaphragm into the right anterior hypochondriac region of the abdomen, ploughing in its course through the anterior surface of the right lobe of the liver, again perforating the peritoneum to escape through the abdominal parietes at a point three inches above and some four inches outside of the umbilicus. The semi-curved attitude assumed by slightly elevating the head and upper part of the body from the horizontal position, at the moment the injury was inflicted, caused the traject of the missile to pass in a line nearly parallel to the axis of the body in the erect position. The wound extended about ten inches from the point of entry to that of exit, and showed little deviation from the original line of flight of the missile. The patient received some temporary assistance on the field, after which he was sent by railway some thirty miles to Memphis, Tennessee, at which place I saw him at about 8 o'clock in the evening. Reaction had fully taken place, and, despite his rough usage, he was feeling cheerful and comparatively comfortable at the prospect of rest and treatment amongst his friends. Sputa freely mixed with frothy blood were expectorated during several days. The fragments of broken rib were sustained in position by a suitable bandage around the chest, and ice was continuously applied over the course of the injury. The strictest rest and freedom from excitement were enforced; opiates were given from time to time to aid in inducing sleep as occasion required. The injury to the liver was manifested by the position, direction, and depth of the perforation, and by the presence for several days of bile with the matter discharged from the lower wound. Notwithstanding the unusually severe nature of the injury and the dangers incident to wounds of the several important structures involved, the patient made an excellent recovery, and convalesced without an untoward symptom. The wound of exit healed up in the course of the fourth week, and on the 22d of December following he was sufficiently recovered to go on sick-leave and accompany his parents to their home in the vicinity of New York city.

The extraordinary nature of his injury, coupled with the fact that he was universally loved and esteemed by all who knew him, endowed the case with unusual interest and attracted much professional attention. The then Surgeon General of the army, Dr. W. A. Hammond, Surgeon John Moore, U. S. A., Medical Director of General Sherman's armies, and several other distinguished surgeons saw the case, and concurred with me as to the extent of the injury to the several structures involved.

This gallant young officer was accidentally and almost instantly killed August 4, 1864, near Cold Spring, N. Y., by being thrown violently from his horse, the animal having been tripped by the sluggish movements of a cow in her awkward efforts to rise from the highway as he rode rapidly past her. A sad termination to a young life full of bright hopes and promises of a brilliant future, especially after having successfully passed through the trying ordeal heretofore described.

CASE II. *Penetrating wound of thorax, perforation of lung; recovery.*—Captain Samuel C. Erwin, Sixth Ohio Volunteer Infantry; aged about 30 years, while leading the skirmishers of his regiment, on the morning of May 30, 1862, into the enemy's works before Corinth, Mississippi, was shot with a musket or rifle ball through the right side of the chest. Being

in the advance with the commanding general, I rode to his assistance, and found him stretched on the ground on the inside of a field work from which his men had driven a part of the enemy's rear guard, but a few moments previously. He was suffering from severe shock, and his symptoms indicated an injury of the most severe character. Upon examination I found that a large bullet had struck him on the anterior aspect of the chest, passed between the intercostal space just below and a little to the inside of the mammary gland, penetrated the thoracic cavity, passed through the lung, and made its exit on the posterior aspect of the same side, a little below and outside the angle of the scapula. The course of the missile was backwards, downwards, and outwards. The injury was inflicted at close range as he entered the work, and the wounds of entry and exit indicated a large sized bullet, as the index finger was readily used in exploring the depth of the lesion. Frothy blood was coughed up every few minutes from the lungs. After the administration of temporary aid he was sent to the rear, and rallied sufficiently to warrant his removal by ambulance the next day to the steamboat landing, some thirty miles, from whence he was transferred on one of the improvised hospital steamers to his home in Cincinnati, Ohio, where he passed from under the control of the medical officers of the army to that of a civil practitioner. No details of his case ever reached me beyond the facts that he made a good recovery and rejoined for duty at Louisville, Kentucky, in September following. He subsequently became a major, but was killed, November 25, 1863, while in command of his gallant regiment at the battle of Missionary Ridge, Tennessee.

CASE III. *Penetrating wound of thorax with perforation of lung and fracture of rib and scapula; recovery.*—Colonel Edward Hatch, Second Iowa Cavalry, aged about 28 years, while commanding a division of mounted troops was wounded in action on the 4th day of December, 1863, at Moscow, Tennessee. While repelling a charge from the enemy's cavalry he was struck by a conical bullet, shot from a trooper's carbine, at close range. The missile struck the chest on a level with and about an inch to the outside of the areola of the right mammary gland, penetrated the intercostal space, pleura, and lung, and made its exit through the back part of the thorax, fracturing the fifth rib, and escaped through the right scapula at a point equi-distant from its apex and borders. The scapula was elevated at the moment of injury—the arm being raised above the head when the wound was inflicted. He was attended by the division surgeon, Dr. John Nigolas, Sixth Illinois Cavalry, from the date of his injury until he was removed to Memphis, Tennessee, on the 24th of the same month, at which time he was still expectorating frothy blood, suffering from difficult respiration, and almost speechless. The impact of the ball was transmitted to the clavicle and thence to the nerves of the axillary plexus, producing partial paralysis of the muscles of the arm, rendering the limb nearly useless for more than a year thereafter. Fragments of necrosed bone were discharged from the posterior wound from time to time, until some fifty-three in all were removed up to October, 1864. The treatment consisted of perfect rest, cold-water dressings, anodynes, and a generous allowance of nourishing diet. His recovery progressed without any unfavourable symptoms, so that he had so far convalesced that he was permitted to go to his home on sick-leave January 18, 1864. He was able to return to duty on the first day of the following March, was appointed a general officer at the end of the succeeding month, and served continu-

ously in the field thereafter until the close of the war, at which time he was transferred to the regular service with his former rank. A short time ago, writing from his station on the Mexican frontier, he stated that he "felt no inconvenience from his old injury except the usual aches and pains from change of weather to which all wounds are subject, and, during hot weather, an occasional sense of suffocation as though there was not quite breathing room enough in the lungs." At that time "the finger could readily push before it the soft parts through the hole in the scapula, but the point of the injured rib could not be detected. The perforation in the scapula appears to be between an inch and an inch and a half in diameter and nearly round. The soft structures over the opening in the bone render it impracticable to determine with accuracy the exact condition of the osseous structures involved in the injury."

U. S. MILITARY ACADEMY, WEST POINT, NEW YORK.

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ART. VIII.—*Dislocation of the external end of the Clavicle upon the Acromion of the Scapula.* By H. F. MONTGOMERY, M.D., one of the Attending Surgeons at the Rochester City Hospital, Rochester, New York.

A REFERENCE to the works of the most recent surgical writers, as those of Gross (*System of Surgery*, 5th ed., vol. ii. p. 46), Fergusson (*System of Practical Surgery*, 4th Am. ed., p. 203), Holmes (*System of Surgery*, 2d ed., vol. ii. p. 804), and Hamilton (*Practical Treatise on Fractures and Dislocations*, 4th ed., pp. 533–5), will show how entirely unsatisfactory has been the treatment of upward dislocations of the clavicle on the acromion in the hands of the ablest surgeons. Dr. Hamilton (p. 535) says that the maintenance of the bone in its socket for a length of time sufficient to insure a firm union of the broken tissues will be found always more difficult, and, in a great majority of cases, absolutely impossible. Nearly all surgeons who have written upon this subject have made the same observation. Failure to retain the reduced bone in its socket has been the rule, and apparently with few exceptions. The successful application of a new and simple method, and at the same time one readily tolerated by the patient, one in no way endangering the circulation through the limb, and one not requiring such prolonged duration as to anchylose the joints, is, therefore, of sufficient importance to be reported.

On the 28th of June, 1875, I was called to see James R., at No. 10 Ford Street, a blacksmith, aged 42 years, who when riding home after his day's work, standing in a wagon, was, by a suddenly accelerated motion, thrown backwards to the ground, striking on his right shoulder. I found the external end of the right clavicle dislocated from the acromion and resting upon it, making a distinct tumour. I took hold of the elbow, and, pushing upward and backward, while I carried the arm anteriorly across

the chest, at the same time placing my left hand upon the projecting bone, I reduced the dislocation with an audible snap. At the same time the deformity was removed and the patient was relieved from pain. I placed the right hand upon the left shoulder and directed a hood for the elbow, or sling such as is used in Fox's apparatus for fracture of the clavicle, to be made, and this I applied to the elbow and tied to a band across the back of the neck, hoping thus to retain the bones in place, but to my disappointment I found before I left the house that the dislocation was reproduced. I then endeavoured to keep the bone in its socket by passing a bandage firmly around the external end of the clavicle and the corresponding elbow; but this was found to be impossible, as the slope of the shoulder would not permit the bandage to be retained in place. I then concluded to try Prof. E. M. Moore's dressing for *fracture* of the clavicle, which I will describe to make my case complete.[1] Having again reduced the dislocation, and keeping it in place by pressure upon the top of the external end of the clavicle, I carried the arm backward and forced the elbow towards the left side across the back, pressing the arm against the side of the chest. Directing a bystander to hold the arm in this position and to keep up pressure upon the end of the clavicle, I called for a common cotton sheet, which I folded cravat-shape by placing the diagonal corners together and then folding these corners over and placing them on the middle of the base-line of the triangle, and again folding the sheet till the "cravat" is about four or five inches wide. The forearm of the injured side being bent to a right angle with the arm, the olecranon is placed upon the centre of the "cravat;" (the length of the cravat being at a right angle with the line of the arm and forearm). The end of the bandage which is next to the body of the patient is carried by a half-spiral turn up along the front of the arm, in front of and over the injured shoulder, and then down across the back to the axilla of the sound side, carried forwards under the sound arm, then upwards in front of the sound shoulder, and over it to the back. The other end of the "cravat," which is away from the body of the patient, is now carried around over the front of the elbow-joint and between the arm and the body to the back of the patient, then upwards across the back to the top of the sound shoulder, there meeting the other end of the "cravat." These ends were then drawn in opposite directions so as to make the bandage as tight as could be conveniently borne by the patient, and were fastened by sewing with a strong thread the lapped ends of the "cravat" to each other and to the portion of the "cravat" which crosses them on the back. The hand of the injured side was supported by a sling fastened around the neck, or which may be fastened to the bandage where it passes over the injured shoulder. After applying this dressing my patient was comfortable, and with no apparent displacement of the end of the clavicle. I visited him the next day; everything was satisfactory. I saw him every second day for ten days, and at each call tightened the dressing and examined the injured part to see that no displacement had taken place. For the second ten days I readjusted the dressing once in three or four days. On the 18th of July, the 21st day of the treatment, all dressings were removed and treatment discontinued, except that the patient was directed to carry his forearm in a sling for a week longer, and not to go to work. There was not the least deformity, nor did the bone once move

[1] The original paper of Dr. Moore on Fracture of the Clavicle may be found in the published Transactions of the New York State Medical Society, 1870.

from its place after the first application of this dressing. The point of discomfort to the patient during this treatment, is under the sound shoulder by the cutting of the folds of the bandage. This must be relieved by passing the finger between the bandage and the skin to change the points of pressure, and by slipping between the bandage and the folds of the axilla some soft cotton-wool.

To show that this is not an exceptional case, and that this form of dressing is to be relied upon, I will state that since this case has been under treatment I have had a conversation with Dr. Moore, in which I informed him of my adaptation of his fractured-clavicle dressing to the treatment of a case of dislocation of that bone from the acromion, and that it was eminently successful. In that conversation he informed me that he had previous to this time heard from five different surgeons, in widely different parts of the United States, of the same successful adaptation of this apparatus to dislocation of the external end of the clavicle. We thus have reports of six cases of success in this dislocation by the use of this method of treatment. It is to be hoped that other surgeons who have tried or may try this dressing, will report them, whether success or failure follow.

This method of treating this dislocation seems to be especially appropriate, and to fill all the requirements. It makes extension by increasing the distance between the sternum and the acromion. It relaxes that portion of the trapezius muscle which is attached to the external third of the clavicle, and which in the normal position of the shoulder tends to draw the external end of the clavicle upwards, and if dislocated would tend to displace it after its reduction. It puts upon the stretch that portion of the pectoralis major muscle which is attached to the clavicle, and thus draws the clavicle downwards, and aids in holding it in place after a reduction of its dislocation upwards on the acromion, and finally the fold of the bandage, which passes over the injured shoulder, presses firmly upon the outer end of the clavicle, and assists materially in holding it down in its place after its reduction.

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ART. IX.—*Case of Chronic Laryngitis, serving to illustrate how the mucous membrane of the vocal cords may be in an objective morbid condition, though their physiological functions be restored.* By BEVERLEY ROBINSON, M.D., Surgeon to the Manhattan Eye and Ear Hospital (Department of the Throat), etc. (Read before the New York Laryngological Society.)

THE following case is given verbatim, as it was written out and handed to me by the patient himself:—

"D. S., thirty years of age. My home is in the West. Three years ago I came to New York city, and entered Union Theological Seminary,

and began a course of study for the ministry. Since then and for about seven years previous, I have been accustomed to more or less public speaking, and to a very great deal of public singing.

"During my vacation last summer (1874), I engaged in preaching for several months on the coast of Maine, and near the close of the summer had trouble with my voice. At first it was slight, but soon became quite annoying. It was not the ordinary hoarseness, but in speaking there would be a catch or break in my voice; and by this I mean that in the midst of a sentence I would lose a word, or rather fail to speak it, oftentimes making several attempts to pronounce it before I would succeed. This was especially marked in singing; here my voice would fail me in the midst of a measure, and I would be unable to complete it. But the quality of my voice was not affected, for my tones were as sure and strong as they had ever been.

"Soon another troublesome symptom developed itself. In the night I would be aroused from sleep with a spasm of the throat, and for some seconds would be unable to inflate my lungs, and in my attempts to do so would whoop like a person with the whooping-cough. In this condition I returned to the city, and in October (1875) put myself under the care of Dr. Beverley Robinson, who informed me that I had *chronic catarrhal laryngitis*. He began treatment with the sulphate of zinc in the form of spray, besides making various applications with the brush three times a week.

"For a month or six weeks there was little or no improvement, and during this period at times even ordinary conversation was difficult and painful. The treatment was continued, and varied from time to time, and presently there began to be improvement, and this continued up to three weeks ago (February 15), when all treatment was left off. Since then I have used my voice both in speaking and singing, and on several occasions put it to a severe test; and so far as I am able to judge, I am now (March 6, 1875) entirely well."

*Remarks.*—In the perusal of the above-detailed case, we shall notice two symptoms which occasionally present themselves in chronic inflammatory changes of the throat and air-passages. First, an inability at times during speech or singing to articulate certain words or give correct and complete tones in familiar measures of musical vocalization.

These phenomena were present at first temporarily, in a slight degree, and only after severe exercise of the vocal organ; at a subsequent period they showed themselves more frequently and persistently, and after a less prolonged effort of voice. Pain during ordinary conversation and spasmodic paroxysms at night were then superadded to the other evidences of trouble, pointing at once to its neurotic origin, as well as to its neuralgic character.

In the beginning and for several weeks general and local treatment, varied according to indications and accepted therapeutic action of particular drugs, remained without apparent results. Little by little, and after a considerable lapse of time, the spasmodic and painful symptoms disappeared, and gradually the voice acquired its normal force and flexibility, till to-day the patient is, so far as he is aware, completely cured.

In this connection, we are led almost naturally to consider two or three interesting facts having a direct relation with clinical study and experience.

The evening our patient was presented to the members of the New York Laryngological Society, the mucous membrane lining his vocal cords was still swollen and very red. In fact, there has been little change in the aspect of the larynx from the time when treatment was begun. And yet this same patient, who talks and sings to-day as well as he ever did, a few months since could only speak and sing in a very imperfect manner, and was awakened at night with painful spasms of the throat. What has taken place? Evidently the laryngeal mucous membrane has not been much changed by local applications. We are therefore obliged to take refuge in one of two hypotheses. 1. The muscles were morbidly affected. 2. The peripheral extremities of the pneumogastrics were diseased.

The painful and spasmodic phenomena at one time manifest, led us to the *nerves* as being the most probable source and seat of the disease, while the lack of co-ordinative power in the muscles was doubtless secondary to the nerve lesion.

Our astringent applications within the larynx, and the medicaments administered by the mouth, have doubtless, therefore, brought back a normal condition in nerve force, and the muscles again act synergetically and with a healthy degree of vigour. Want of vocal power is no infrequent occurrence, we are well aware, during and subsequent to catarrhal inflammations of the throat, either of an acute or chronic order. And for this loss of functional tonicity to show itself, it is not essential that the morbid processes should affect directly the mucous membrane lining the vocal organ itself. The inflammatory condition may only be obvious in the pharynx, and the larynx be apparently healthy. Such facts are explained by us in attributing the change of voice to abnormal circulation or diseased structure in or about the pneumogastric trunks.

In these cases, however, the tones of the voice become, as a rule, *pure*, as the parts adjacent to the larynx are favourably modified by local remedies. True it is, as Krishaber has demonstrated, that after catarrhal or other inflammations and changes of the vocal cords, the voice may remain hoarse and weak for a greater or less period of time, and the muscles be deficient in contractility, although their *visible* condition is healthy. In our case the mucous membrane of the glottis continues to be red and infiltrated, and the voice, singularly enough, is completely restored.

Happily our interpretation, which follows, is sufficient to give a rational explanation of a clinical state rigorously observed. All gynæcologists are familiar with facts of an analogous description. In nervous, hysterical, neuralgic women, do they not find that neuralgia affecting the lumbo-abdominal nerves frequently leads to congestive disorder of the interior

surface of the womb, and also to concomitant dysmenorrhœa, amenorrhœa, and metrorrhagia?

Our patient was evidently labouring under nerve disorder of the throat from the time when his voice first began to fail him.

And now that the other manifestations of disordered innervation of functional or organic origin have disappeared, chronic thickening and congestion of the laryngeal mucous membrane still remain.

Will it disappear? In time it may. Having regard, however, to the nature of his profession and to the frequent calls made upon his voice, in fact to the *exaggerated* use of this organ which he is almost of necessity forced to make, we can hope for no *speedy* change in this respect unless he should guard relative or absolute repose from speaking aloud and vocalization.

There is still a point to which we claim attention. Modern physiology teaches us that the inner borders of the true cords alone furnish sonorous vibrations when air escapes from the lungs through the glottis during an expiratory movement.

It would, therefore, seem as if, and we believe it is thus generally understood, the vocal cords should be altogether normal in structure and appearance at this margin in order to make the act of perfect phonation possible. And, without doubt, this received opinion is usually the correct one, for the rule is that, whenever the interior lining of the glottis is even slightly congested, thickened, or in any manner altered, articulate speech is notably modified.

In our case, reported above, we have, nevertheless, an instance of a departure from healthy appearances, and yet the timbre and strength of the voice are to-day what they were when it was believed to be, and it probably was, in a normal state. Such an example must tend to establish the belief that integrity of the peripheral extremities of the laryngeal nerves and well adjusted action of the muscles are quite as important to the proper and accurate production of vocal sounds as the condition of the mucous membrane.

We find also this view corroborated by analogy with certain instruments of music. Take for example the violin or violoncello. Do we not know that although the cords may be somewhat worn by use, if the proper tension be given them, and the instrument is otherwise perfect, under the bow of a skilled artist the sweetest and purest notes can be produced?

Now most facts in medical science are true with limitations. And this is certainly correct with respect to what we have endeavoured to prove. Manifestly we have no wish to affirm that the laryngeal mucous membrane, when morbidly affected to an *exaggerated* extent, will not occasion more or less complete aphonia.

Too frequent instances, with few or no exceptions, where growths or deep ulcerations upon the vocal cords have been the proximate and effi-

cient cause of similar trouble, are present to our mind for the truth of such a statement to be admitted. We would merely point out and lay stress upon this important clinical fact, not in our knowledge *sufficiently* made known to us by recognized authorities in like matter, *that good and strong if not perfect power of articulation in speech and singing, may exist though the vocal cords are congested and somewhat thickened.*

Finally, we offer the following proposition as being the expression of what in our estimation should be received as a *probable truth*, viz., actors, singers, public speakers, hawkers, etc., acquire, after a period of time more or less prolonged, a chronic inflammatory condition of the laryngeal mucous membrane, and especially of that portion of it lining the vocal cords, which, although treated actively and with the result of ridding them of painful or unpleasant symptoms, will continue to exist for a long while, and for this state, general or topical, remedial agents are inefficacious. Change of occupation would no doubt eventually bring about such effect in the nutrition of the parts as to restore them gradually to normal appearance as well as to normal function. Unless this indication be practically dealt with, it is probable that everything else in the way of treatment, prophylactic, hygienic, or poly-pharmaceutic, will in some cases be to no purpose.

37 WEST 35TH STREET, NEW YORK.

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ART. X.—*On the Treatment of Venereal Disease by Salicylic Acid, with eight illustrative Cases.* By GEORGE HALSTED BOYLAND, M.D., Laureate of the Leipzig Medical Faculty.

A DECADE since no one would have thought of connecting the contagion of venereal disease with the presence of microzymes. The infections of gonorrhœa, phagedæna, balanitis, posthitis, etc., were indeed admitted to be the result of poisoning by means of some physico-chemical action or inflammatory process, spreading not only from one individual to another, but from part to part of the tissue in which it begins—as, for instance, the spread of gonorrhœa along the mucous surface affected by it. Modern investigators, however, have led us to the conviction[1] that this morbid agency is principally due to the existence of lower organisms. If we place upon the object glass of the microscope drops of the discharge from the urethra of patients passing through the different stages of gonorrhœa or gleet, we find that the micrococci increase or decrease in a direct proportion to the severity of the inflammation. In the burning, greenish-yellow, virulent secretion of acute gonorrhœa, their numbers literally obscure the view;

[1] Medico-Chirurg. Trans., 1874, p. 285.

while in the milky, viscid, at times almost colourless discharge attending gleet, their presence though readily detected is very much less marked. As much may be claimed for phagedæna, balanitis, and posthitis. The fact being then established that these diseases are of parasitical origin and nature, the *rationale* of treatment is evidently the destruction of organic matter.

That salicylic acid annihilates both animal and vegetable parasites, as well as prevents their development, and may therefore be employed to advantage in the treatment of venereal disease, I have already briefly alluded to in a paper[1] giving the general history of salicylic acid as a disinfectant from the date of its discovery as such down to that in question. I have since applied it in the treatment of the diseases above mentioned. The results surpass all expectation.

The following record of cases is published in the hope that it may prove interesting to the medical profession, and that others may in their turn try this new and efficacious method of combating these terrible diseases.

CASE I. *Gonorrhœa complicated with non-indurated chancre.*—B. M., æt. 22, unmarried, clerk in a banking house; called upon me Nov. 14, 1874; had had gonorrhœa once before, in 1870, of which he had been cured before the supervention of gleet. I saw him on the sixth day after coition. There was no swelling of the prepuce or the meatus urinarius—but a slight discharge from the urethra. Five non-indurated chancres were present: one on the glans penis, two under the corona on the dorsal surface, and one each side of the frenulum. These last named had almost destroyed the tissue between the frenulum and the urethra, and were threatening to perforate into the fossa navicularis, having already eaten through behind the frenulum, which still remained intact like a bridge over this artificial canal through which a director could easily be passed. The chancres were thoroughly cauterized with the lapis infernalis, and dressed every four hours with charpie dipped in a solution of salicylic acid of 1 : 100 of water, the same being injected into the urethra thrice daily.

*Nov.* 30. Discharge from urethra almost entirely disappeared, chancres healthy, granulating sores.

*Dec.* 12. Chancres all healed save one. Discharge from urethra, patient informed me, had completely ceased since the 4th inst. Cauterized the remaining chancre and continued the use of salicylic acid both as a dressing and an injection.

20*th*. All traces of disease gone; patient discharged cured. I saw this man several weeks later, and there had been no return of disease.

CASE II. T. L., an officer suffering with acute gonorrhœa, painful erections, insomnia, etc. Glans swollen; lips of meatus purplish-red, and protruding. Treated him with injections of salicylic acid of 1 : 200, increasing gradually in strength as the inflammation subsided until a solution of 1 : 100 of water was attained. At the same time a mixture of salicylic acid was given per orem as follows: ℞. Acidi salicylici, grs. 18; tinct. anodyne simpl. gtts. 25; aquæ destil. oz. iij. M. S. A teaspoonful hourly.

[1] The Lancet, Nov. 28, 1874, p. 785.

Patient did not complain of any scalding sensation after injecting—such as is often experienced after using zinc. sulph., argent. nitr., or plumbi acetat., and was at the end of five weeks discharged cured.

CASE III. C. Y. This gentleman, engaged in active business, had four soft chancres. The salicylic acid treatment was employed after cauterization as above; cured.

CASE IV. S., aged 28, had previously been treated for syphilis; was at present afflicted with chronic serpiginous ulcer of the left leg. I employed the same remedy externally, with Zittmann's decoct. per orem, to which were added grs. 10 of salicylic acid at each dose. In one month the patient was able to resume work; cured.

CASE V. D. O. L., married gentleman, æt. 38, suffered with balanitis and posthitis, the glans penis and inner lining of the prepuce presented a turgid, reddish appearance; their surfaces were uneven and covered with a whitish-yellow slime; the epithelium of the glans was disturbed. A small compress moistened in a watery solution of salicylic acid of 1:100 was applied to the parts four times daily for fourteen days; cured. This balano-posthitis was undoubtedly produced by the chemical action of the menstrual fluid upon the tissues, as the patient confessed to me that he had had intercourse with his wife during her last menstruation.

CASE VI. N. A. C., carpenter, æt. 40, had a gleet of 18 months' standing. The endoscope was used and the interior of the urethra illuminated. Discovered a large purplish-red patch at the point of junction between the pars cavernosa with the pars prostatica. A concentrated solution of salicylic acid of 1.:5 was injected through Guyon's graduated stem syringe. The instrument was passed down beyond the patch as recommended by Mr. Berkeley Hill,[1] in withdrawing slowly when the bulb of the stem reached the inflamed spot grs. 3 were injected. A weaker solution of the acid (1:100) was then ordered to be injected thrice daily for four days, when the concentrated solution was again used, followed as before by the weaker. This man was twenty-five days under treatment; cured.

CASE VII. Sarah P. H., æt. 19, unmarried, was suffering with vaginal gonorrhœa, contracted in the latter part of February. First saw her on the 2d of last April. Used vaginal injections and douches of salicylic acid—solution 1:100, containing two parts of the phosphate of soda; the acid was also administered per orem, as in Case II. April 30th. The patient was discharged cured.

CASE VIII. Charlotte M., æt. 22, unmarried, was afflicted with soft chancres complicated by a suppurating bubo on the right side just above Poupart's ligament. The chancres were cauterized with the lapis and dressed with salicylic acid as above. The bubo was freely incised (the bistoury being first moistened in a solution of the acid, the spray of which was at the same time thrown from the atomizer upon the surface of operation). The wound was then dressed antiseptically with a solution of salicylic acid of 1:100 of water; healed rapidly; cured.

The above notes, though fragmentary, show the value of salicylic acid as a remedial agent in the treatment of venereal disease; they must, however, be left to speak for themselves. Four of the cases had been subject to treatment before they came under my charge.

[1] Lancet, Feb. 13, 1875, p. 224.

ART. XI.—*Aneurism of Thoracic Aorta; extensive Hemorrhage some days before Death, without marked Symptoms.* By STUART ELDRIDGE, M.D., Surgeon to Yokohama General Hospital, Yokohama, Japan.

W. H. T., a man apparently in good general health but of exceedingly dissipated habits, consulted me March 15th on account of a chronic acne of nose and cheeks. I saw him again March 20th, and again March 28th, when the acne was better, and he declared himself as feeling in every way more comfortable than for some months, as pyrosis and constipation, from both of which he had been suffering, had disappeared under strychnia and hydrochloric acid which I had prescribed.

*April* 3. The patient called at my office, stating that for the past five days he had been suffering from dull pain in right hypochondrium and right shoulder, with return of constipation. I questioned him as to cough or pain in chest, neither of which was present. Temperature 98.6° Fahr. Respiration 19 per minute. Pulse natural in quantity and quality, and 75 per minute. Percussion over liver, to which I with difficulty persuaded him to accede, as he was in haste to attend to some business, showed that the organ was much enlarged both laterally and downward; the upper limit was not defined, as the patient would afford me no opportunity to examine it. Prescribed acid. nitromur. dil. ♏90; sp. æther. nitros. ℥iij; ext. taraxaci, ℥iij; tr. sennæ, ℥iv; aq. dest. ad ℥vj. Two tablespoonfuls thrice daily.

4*th.* Patient called at my office at half-past nine o'clock A.M., announcing himself as feeling much better; ordered dry cups over liver; to continue mixture. Patient returned home, attended to his business (that of a saloon-keeper) during the morning; at 2 o'clock ate a hearty tiffin, and was on his feet much of the time till nearly four P. M., when death took place as follows, this being the language of the only witness present:—

"I was present at the death of deceased, about twenty minutes past four o'clock, the afternoon of yesterday, April 4th. . . . . Deceased waited upon me, after which he took some medicine, about half a wineglassful. Shortly after this he put his hand on his breast and sat down, asking me to sit before him. I did so, and was hardly seated when he fell off in a faint—dead."

*Autopsy*, 13 hours after death. Present, Doctors Hepburn, Wheeler, Dickinson, U.S.N., and Tripler. Abdomen opened. Liver enlarged and much displaced downward; enlargement estimated at one-third. Liver hard, elastic, and surface marbled with yellow; on section presented a nutmeg-like appearance; vessels compressed, and organ very anæmic.

Spleen enlarged and soft. Right kidney atrophied to one-half natural size, soft, and presenting three small subscapular abscesses of anterior surface. Left kidney double natural size, soft, and fatty. Stomach and bowels not examined.

On opening thorax a quart or more of clear serum escaped. On reflecting sternum, found the cavity of right pleura occupied by a firm and tenacious white fibrous clot about four pounds in weight; the right lung compressed to the size of a fist, and packed away in the costo-vertebral angle. This large white clot was of uniform consistence and color throughout, reminding one forcibly, save in size, of the ante-mortem clots so frequently found in the mouths of the cardiac outlets. On removing this clot from

the thorax, we found below it, in the right pleural cavity, about a gallon of fresh clots and liquid blood. No pleuritic adhesions on right side; on left side old but slight adhesions were found at two or three points. A careful dissection of mediastinal region was then made, which revealed a fusiform aneurism of thoracic aorta extending from immediately below the arch to within an inch of the diaphragm. The sac would have held nearly a pint. The aneurism lay upon the anterior aspect of the bodies of the vertebræ, slight erosion of which had taken place. Rupture of the sac had occurred longitudinally for about three-quarters of an inch at right margin of contact with vertebræ. The aneurismal wall was very thin throughout, more especially in that portion which was in contact with the vertebræ, and no laminated fibrin was found either in the sac or pleural cavity.

There are several points of interest in this case :—

1. That so great and sudden a hemorrhage as must have taken place some days before death, in order to form the large white firm clot found, could have occurred without marked symptoms.

2. That a rupture sufficient to give vent suddenly to so large an amount of blood at one time should have again closed, even temporarily, the more so as there was no evidence of any attempt at spontaneous cure. That the large white clot was the result of a rapid effusion of blood, I think is proved by the perfect homogeneity of the clot both as to colour and consistence.

3. That with one lung compressed to absolute uselessness, and with a pleura full of clot, there should be no apparent interference with respiration.

Of the practical lesson to be derived from the foregoing case, it is hardly necessary to speak.

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Art. XII.—*Two Cases of Recovery from Diphtheritic Croup, one case with, the other without, Tracheotomy.* By R. and R. J. McCready, of Sewickley, Pa.

Case I. January 4th, 1874, was called to see Marg. H. McM., æt. 21 months. She had been feverish all night; complained of throat; the tonsils were swollen; soft palate covered with eruption of scarlatina; ordered carb. ammonia half gr. every three hours, and inunctions of lard over whole body.

*January* 5. Eruption well marked on face and neck; cervical glands swollen.

6*th*. Eruption over whole body; throat very sore; ordered wash of alum and honey; suffers from difficulty of swallowing on account of extreme swelling of cervical glands. 4 P.M. Dr. Mowry, of Alleghany City, called in consultation, who concurred in diagnosis, and on account of more local effect on throat ordered R. Tinct. ferr. chlorid. xxxij; chlorate potass. ℥ij; aqua, ℥ij. Sig. A teaspoonful every three hours in sweetened water.

*7th.* Early this morning had several passages of a muco-sanguinolent nature; ordered chalk mixture; breathing better; glands not so much swollen.

*13th.* 9 A. M. Fever has entirely subsided; throat well; tumefaction of glands disappeared; child is sitting up playing with her toys; consider her convalescent.

*13th.* 6 P. M. While visiting another member of the family, noticed the child cough and thought I could detect a slight stridulous tone. On inquiry, the mother stated that she had observed the child cough a little hoarse two or three times before this afternoon; found a small patch of diphtheritic membrane on tip of uvula, also on top of the epiglottis; ordered tinct. of iron and chlorate of potassa to be administered as before.

*14th.* 8 A. M. Patient restless all night; skin very hot; pulse frequent; breathing laboured; cough characteristic of well-marked laryngeal trouble. Ordered emetic of syr. of ipecac and pulv. alum.

7 P. M. Dr. Mowry again saw the patient, who is still growing worse; tried to use the lime-water spray, but, on account of struggles of the child was compelled to desist. Gave three doses of alum and ipecac, but without effect.

10 P. M. Breathing of patient can be heard in all parts of the house; she tosses from side to side; passes from person to person, vainly seeking for more breath. Raised temperature of room to 80°.

*15th.* 7 A. M. Has not slept any all night; unable to take more than a sip of milk on account of its being sucked into trachea by violent inspirations; tried again without avail to produce emesis by titillating fauces; the lips of the child being livid and finger-nails blue; pulse 140. Told the parents the only hope was in tracheotomy, but that this would not necessarily save her life, but would afford one more chance. We asked for additional counsel, and Dr. A. G. Walter, of Pittsburg, and Dr. Mowry, of Allegheny City, met us at 6 P. M. After examining the patient, all agreed that the child could possibly live but an hour or so longer unless relieved by tracheotomy. Pulse at this time was so frequent and feeble that it could hardly be counted. While we were consulting, they called to us to haste, as they thought the child was dying. It being then 6.30 P. M. it was necessary to operate by artificial light. The child was placed in the usual position for the operation. Indeed, it did appear as if it were a useless undertaking at this time, as the child was already powerless. The strangers did not attract her attention; her features wore the expression of intense agony, such as a person suffering from a severe attack of asthma. Ether was very carefully administered. The trachea was skilfully opened by Dr. Walter, by an incision through three of the cartilaginous rings immediately below the cricoid cartilage. There was considerable venous hemorrhage, which was controlled by sponges placed on ice and pieces of ice placed on the wound. When the incision was made into the trachea, breathing ceased, but respiration was re-established by pressing on the thorax and holding open the trachea by means of retractors. The edges of the wound were held open by means of wires held back by adhesive plasters. Child went to sleep and slept quietly for two hours; after that gave half gr. Dover's powder every three hours. Did not sleep well during the remainder of the night, partly due to mucus obstructing the opening in the trachea. Applied flaxseed poultices to the chest; child took several drinks of milk during the night; temperature of room 76°; generated steam as freely as possible.

16*th*. 7 A. M. Cleansed wound thoroughly; inserted a double silver canula for the first time; child slept two hours. Ordered powders of pulv. ipecac et opii and quin. sulph. āā gr. ss, every three hours. To give all the beef-tea and milk she will take, also, a teaspoonful of whiskey every three hours.

17*th*. 9 A. M. Pulse 130; sleep disturbed on account of having to remove the inside tube every five or ten minutes on account of its becoming obstructed with mucus. Takes on an average ℥ij of milk every two hours.

17*th*. 4 P. M. Restless all P. M.; removing inside tube does not appear to relieve her. The obstruction being chiefly to expiration, we thought there might be a plug of mucus around lower end of outer canula. We removed both canulæ and found a ring of mucus surrounding the outer canula which had acted as a valve, fortunately only partially closing the opening during expiration; removed wires, adhesive plasters, and everything from neck; washed with warm water and castile soap. The wound was covered with a dirty brown membrane similar to that in fauces. Applied to the wound a solution of argent. nit. 20 gr. to ℥j; oiled wound with carbolized olive oil; replaced canula without difficulty, first inserting it in a wide slip of adhesive plaster in order that the wound might be protected from shoulders of the canula. Child went to sleep and slept quietly for one hour. Removing canula does not disturb her so much now, as we keep it well oiled with carbolized oil.

7 P. M. Dr. Walter visited the patient.

18*th*. 9 A. M. Pulse 120; respiration 30; has rested well all night; we placed the thermometer in an adjoining room and raised the temperature to 76°; moistened the air with steam and then removed the child to this room. The patient's room was thoroughly cleaned and aired; bed-linen changed and windows all left open for some time; while the room was being cleaned we removed both canulæ and washed the wound as before. The thermometer was then removed to patient's room, and when the temperature had reached its proper height we removed the child.

19*th*. 9 A. M. The cleaning of the room repeated as before; while this was being done the child was thoroughly bathed; clothes all changed; entire canula removed. Heretofore the child has been getting opiates regularly, but when patient was taken back to her room she went to sleep and slept quietly for two and a half hours.

19*th*. 1.30 P. M. When awoke from sleep took a glass of milk, and went to sleep again. Pulse only 96. It had fallen in two hours from 120 to 96, as 120 was the lowest her pulse had been since some time before the operation; respiration 24.

20*th*. 9 A. M. While removing canula and dressing the wound, a large piece of tough membrane was expelled through opening in trachea.

21*st*. This morning, while being bathed, she noticed her toys, and pointed to them, took her doll in her arms, and brushed its hair with her brush.

24*th*. Can breathe a little through the larynx for the first, while the opening in the trachea is closed; but after three or four inspirations shows signs of suffering.

26*th*. Breathing through larynx still improving, but points to the canula, then to her throat, as if to say "put it in again."

28*th*. 10 A. M. Removed canula; wound very small, hardly room for canula; wound closed with adhesive plaster. Child said "mamma" plainly but quite hoarsely; walked three or four steps to her mother.

Concluded to leave the canula in another day, as the child does not appear quite comfortable without it.

29*th*. 9 A. M. Removed canula; closed the wound with adhesive plaster.

30*th*. 10 P. M. Breathing not so tranquil as heretofore; applied a flaxseed poultice over neck and breast; went to sleep, and slept quietly the remainder of the night, only waking to take a glass of milk.

Time from opening of trachea to removal of canula, 13½ days.

*Remarks.*—As proof of the first attack being a true case of scarlatina, we would state that an uncle of the child while on a visit to the house contracted scarlatina, which ran a regular course. There were also several cases of scarlatina in the village at the same time. As proof of the true diphtheritic nature of the second attack, we would refer to the wound forty-eight hours after the operation being covered with membrane, also to two brothers of the little girl who each had an attack of diphtheria, in which the membrane in the throat and the constitutional symptoms of the disease were well marked. The father of the child had a scratch on his finger; a membrane formed on it; we applied nitrate silver, and removed the membrane, but it re-formed in a few hours. Before the child recovered, another uncle of the patient, who assisted in waiting on the child, took diphtheria, and passed safely through the disease.

We will give a short account of the after-treatment of this case, as we think more cases of tracheotomy would be successful by careful attention to the minutiæ after the operation. As the most important, we would mention: 1st. The uniform high temperature and moist atmosphere of the room. 2d. Attention to the canula. 3d. The ventilation. 4th. The thorough use of disinfectants. 5th. The attention to the patient. The temperature of the room for three days after the operation was not allowed to vary a single degree from 76°. The thermometer hung at the head of the bed. The moist atmosphere was maintained by two large tea-kettles on the grate, with a sheet-iron blower above them, in order to increase the draft, and to prevent the escape of the steam by the chimney. Vessels were placed in the room filled with boiling water, and they were kept steaming by means of hot bricks placed in them. The room was thoroughly ventilated every day, as stated in the history of the patient. The disinfectants used were permanganate of potassa and carbolic acid, placed in large vessels filled with water under the bed, and changed regularly every three hours.

The canula, being so small, required constant attention; sometimes it would hardly be inserted until it would have to be removed; frequently it was necessary to pass a feather through the canula into the trachea to excite coughing, in order to expel the mucus from the trachea. The canula and wound were kept oiled with carbolized olive oil. The attention to the child consisted in bathing and changing clothes once per day. The only clothing worn was a suit of flannel, with stockings, next to the skin;

enveloping the chest in front and rear was oiled silk, which acted as a poultice. We cut a hole in the silk just large enough to let her head slip in, then strapped the silk down with adhesive plaster. This dressing was changed each time she was bathed. The most of the nourishment consisted of good rich milk, of which she was very fond.

For the first four or five days she was subject to severe coughing spells, so severe that she would almost strangle. After each of these we gave her a small teaspoonful of whiskey in milk. It was necessary to use an enema occasionally, on account of the Dover's powders. We see this child frequently; her voice appears as clear as before the operation.

Case II. October 14th, 1874, was called to see a neighbour's child, æt. 4½ years, who had complained of his throat during the day. Pulse 100; skin hot and dry; tonsils red and swollen, with a slight exudation on one of them. Ordered potass. chlor. gr. iiss every three hours.

*October* 15. Pulse 110; cervical glands swollen. Does not complain so much of throat. Did not rest well during the night. Holds his mouth partly open. Both tonsils were covered with membrane. Diagnosis diphtheria. Ordered J. L. Smith's formula for tinct. iron and potass. chlorat., to give him plenty of milk, beef-tea, broths, etc.

16*th*. Pulse 110; skin not so hot. Rested better last night. Parents state he made a great deal of noise breathing while asleep; that appeared to come from his throat. The membrane of one tonsil is partly detached, and flaps up and down with each act of respiration. Patient looks brighter, is dressed, plays about the room for a few moments, then lies down to rest. Cautioned the parents to be careful, and not let him be exposed to any drafts of cold air.

18*th*. Pulse 90. Patient looks bright, and appears well. During my visit noticed the child cough slightly, and thought I could detect a croupy sound; when he coughed again it was more marked. I inquired if they had noticed the character of his cough. They said they had noticed him cough a little croupy at 4 A. M. They then told me that the child had slipped out at the door the day before, a very cold and raw one, and he was gone several minutes before they had noticed his absence. Ordered the patient to be kept strictly to the warm room, and be more diligent than ever in giving him plenty of nourishment, as in all probability he would need all his strength to baffle with the present form of his disease. 8 P. M. Pulse 100. Patient still bright, but coughs more frequently. Told them not to bring him from his room in the morning They are surprised at my uneasiness in regard to the child.

19*th*. 8 A. M. Pulse 110; skin hot and dry; coughs oftener and more croupy. Did not rest well last night. Membrane has entirely disappeared from fauces. Placed a thermometer at the head of his bed, with instructions to keep the temperature of the room from 75 to 80°. Tea-kettles to be placed on the grate, arranged as in Case I. Patient refuses food this morning; ordered to administer it regularly as medicine. 9 P. M. Have seen the child frequently during the day; is still growing worse; coughs almost continually; face very dark colour; medicine changed to ammoniæ carb. 1 gr. et quiniæ sulph. ¼ gr. every three hours. Used the lime-water spray.

20*th*. 8 A. M. Pulse 130; temp. 102⅘°. Did not sleep any all night. Expression of agony on his countenance; tosses from side to side; have

to force him to taste his food. 8 P. M. Dyspnœa still increasing; has severe attacks of coughing; when they came on we slaked lime and held him over the fumes. Breathing can be heard in all parts of the house. Expecting to see the child strangle in some of these severe attacks, concluded to have everything ready to open the trachea. When on my way to the office, and about one hundred yards from the house, the child being up stairs in a closed room, I could hear him breathing very distinctly. Child did not sleep any during the night, but kept tossing about the bed.

21*st*. 9 P. M. No change, except appears drowsy, and the attacks of coughing are not quite so frequent. Pulse 140; temp. 103½°. Blood is very imperfectly aerated, as his face is almost purple. Remained with the patient all night. When I left there appeared to be some little improvement.

22*d*. Has been gradually improving during the day; has slept some three hours; does not resist the food quite so much.

23*d*. 9 A. M. Parents stated that the child coughed up something in his throat, but before they could get him to spit it out he swallowed it. Ate a little food this morning with some relish. From this time the patient gradually improved; had no further trouble, except some six weeks after had some paralysis of the palatine muscles, which allowed the fluids to regurgitate through his nostrils.

*Remarks*.—We present this case as one treated without emetics, without calomel, but by tonics and stimulants. We believe that the atmosphere of the room and the use of the slaked lime were valuable in this case. The patient resisted the lime-water spray so much that we were unable to use it more than three or four times each day. We do not wish to be understood as claiming this treatment as something new, but to add one more successful case in its favour.

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ART. XIII.—*Case of Severe Prolapsus Recti of eight years' standing; Cauterization by Nitric Acid; Operation by Clamp and Cautery; Prompt Recovery and Cure.* By FRANK D. BEANE, M.D., of New York.

THE following case came under my care February 25, 1875:—

Mrs. P., æt. 42 years, English, married, mother of two children, ceased to menstruate about five years ago; has always enjoyed good health. Has been "a hard worker," accustomed to lifting heavy articles in the capacity of domestic, to which cause she attributes her present trouble. About eight years ago she began to be troubled by a slight "falling of the bowel," greatly increased after the birth of her younger daughter, now nearly seven years old; and for the past five or six years she has been nearly as much afflicted as at present. Constipation has existed many years, requiring the habitual use of aperients daily. Never had piles. No indulgence in stimulants, but whenever she would imbibe a glass or two of her national beverage—beer—the prolapse was greatly aggravated. This affliction has

never been painful nor attended by hemorrhage, but by a constant mucous discharge; nevertheless it has been a great discomfort and inconvenience. Patient always able to reduce the prolapse easily. Never consulted advice till the present.

At the present time, walking a block or two, lifting a pail of water, or the like, going up and down stairs, even sitting to urinate, and, of course, the act of defecation, etc., cause prolapse of the bowel, which I find to the extent of three and a half inches of the *entire gut*. The mucous membrane is of little darker than normal appearance, not tender to the touch.

Thorough examination by the finger and Sims' speculum reveals no stricture or abnormality. Uterus in normal position and healthy. Stools natural in colour and consistence, only hard and scybalous from neglect of the aperient pills for two or three days. Patient desires a cure.

To note its effect, I to-day (Feb. 25th) thoroughly applied acid. nitric., C. P., in five broad vertical stripes the whole length of the prolapsed tissues, first having wiped the mucous membrane perfectly dry. Constant application of ice to the fundament was required for twenty-four hours, also opium, to relieve pain. Moderate febrile movement, accompanied by considerable pain in the region of the duodenum and ascending colon, for two days. Perfect rest in bed for five days. Bloody stool three days; both defecation and micturition attended by prolapse. After this, enemata of decoction of rhatany, liq. ferri subsulph. (gtt. xv to xx each time) twice daily, were successively employed for a couple of weeks, *all without the slightest* effect. I advised, and she accepted, an operation. March 29th, assisted by Drs. J. S. Fitzgerald and B. C. McIntyre, patient under Squibb's ether, I drew down the bowel (spontaneously reduced by muscular efforts during anæsthetization) with some difficulty, and it was held by Dr. F., while I applied Henry Smith's clamp-écraseur successively to two anterior and two posterior vertical folds of mucous membrane (three included a length of $1\frac{3}{4}$ inches each, the other $1\frac{1}{2}$ inches), cut off half the tissue above the clamp and burned the rest to the level of the instrument by the *actual* cautery. The tissue removed, *in toto*, had a vertical diameter in each stripe of $\frac{1}{4}$ inch. Anointed the parts with carbolized oil (1 : 8) and returned them within the sphincter.

An enema given previous to the operation emptied the bowel thoroughly. Etherization was unusually slow on account of vomiting. Before the operation, pulse 72, regular, full, soft—temperature (axilla) 100° F.

Five hours following, pulse 84, temp. 99.4° F. To take tr. opii deod. (Squibb) at bedtime, and thereafter to relieve pain. Ice *ad libitum*. Milk and broth diet.

The temperature stood at 100° F. the eve of the first and second days following; thereafter ranging from 99.3° F. to 99.6° F., on the eighth day, normal. The pulse 88 and 86 the first two days, then normal (72). No other pain than a dull ache in the rectum was present till the fifth day, when confection of senna produced a small stool, causing considerable *smarting* pain at the anus, requiring a good dose of opium, otherwise only taken at bedtime for sleep. The eighth day slight oozing of blood followed stool, merely enough to stain napkin. To resume ordinary diet, heretofore liquid principally. To inject and retain ʒij, morn and eve, of a solution of chlorate of potassa, ℈ss ad ʒj.

29th day. Began sitting in chair the 14th day, to walk the room and hall the 21st. Natural stool daily by aid of aperient pills, painless after the 12th day. There has been an involuntary flow of muco-pus at

times during the day, sufficient to soil napkin, till the past two days, ceased. Discontinue chlorate enemata. Although she sits upon *pot de chambre*, walks much, and sits up all day, *there has not been the slightest prolapse since the operation.*

*Per speculum.* Mucous membrane perfectly normal, disappearance of the bluish hue. Wounds thoroughly healed, leaving four firm cicatricial columns; columns retracted, the mucous membrane thrown forward in folds on either side of each. No apparent tendency to prolapse.

44th day. Has walked long distances, washed, ironed, etc., with perfect impunity. And now (June 22), remains perfectly well, having resumed her ordinary household duties and exercise.

*Remarks.*—The predisposing cause in this case was undoubtedly constipation, aggravated by the habitual use of purgatives through their debilitating influence upon the nervous and muscular force of the intestines. Her labours had both been extremely easy, recovery from delivery prompt, never suffered uterine complaint, so that here was no eccentric cause. The absence of hemorrhage, hemorrhoids, and pain was certainly remarkable, considering the long existence of the disease. The case is unique as regards the slight exciting cause of prolapse, as simply walking so short a distance as a block. The inefficiency of the nitric acid cauterization, so happy in its results in a case reported lately by Mr. Jonathan Hutchinson,[1] was manifest, inasmuch as not the slightest effect followed, although aided by perfect rest in bed and the after use of astringent enemata. The tendency to abdominal inflammation, however, was as clearly shown as in the above-mentioned case, but the effect of opium treatment was more pronounced, or, more probable, the patient's excellent constitution was better able to resist the threatening evil.

The operation scarcely needs further recommendation of its superior advantages than this case demonstrates. Not difficult of performance, an entire avoidance of hemorrhage by reason of the firm eschars, pain following no greater, if as great—less in this instance—and nothing like the shock and constitutional disturbance following the nitric acid treatment, *its effects are immediate and permanent*, provided proper care of one's self be afterward observed.

The fear of subsequent stricture has no force when this is compared with the nitric-acid treatment; in the one case the amount of tissue removed and to slough is carefully calculated and regulated, in the other the sloughing is necessarily bounded by no such line; may extend to an undesired, unfortunate limit, especially in cases where, whether from constitutional debility or local irritation, the mucous membrane may be preternaturally unresisting, and its diffuse, sympathetic influence be incalculable. The operation is as safe as for hemorrhoids by any method; septicæmia, etc., not at all likely to occur—effectually guarded against, because the opposite surfaces below the eschar are so firmly coaptated by the clamp as

[1] Med. Times and Gazette, March 27, 1875.

to really make them a solid mass, a well-nourished base upon which is superimposed a dense eschar, to be rejected by a clean process of ulceration.

Astringent lotions, enemata, suppositories, trusses, etc., are a delusion in cases of any moment; troublesome and discouraging to patients, unsatisfactory to the surgeon. Other operations, as snipping off a fold or two of skin at the verge of the anus, removal by ligature of pieces of the mucous membrane, Dupuytren's like removal by scissors, excision of a V-shaped piece of the sphincter ani, cauterization by nitric acid, are all greatly inferior to the operation by clamp and cautery, by reason of their *inefficiency*, hemorrhage, or subsequent bad results. The special advantages of this operation over nitric acid are:—

1. Absence of danger from abdominal inflammation.
2. Absence of hemorrhage.
3. An immediate cure follows a well-performed operation; non-requirement of its repetition.
4. Accuracy with which the amount of contraction of the mucous membrane may be determined. *No danger of subsequent stricture.*
5. Presence of *firm* vertical supporting cicatricial columns, with the sphincter ani for a base, in addition to the narrowed calibre of the gut.
6. Lessened danger from absorption of septic material from sloughing surfaces, even in cachectic subjects.

Referring to the various surgical authorities of to-day, I find Gross, Erichsen, Spence, Hamilton, Van Buren, Ashton make no mention of this; Allingham merely refers to it briefly and in discouraging terms; but Henry Smith[1] lauds it; Bryant says: "Few operations in surgery are more successful than this, and although in children it is probably never called for, in adults it should never be rejected, except for the same causes as operations for hemorrhoids," and Ashhurst recommends it as the best of operative procedures.

In conclusion, when we possess means which will effect the desired result, *cito, tute et jucunde*, simply requiring decided and confident recommendation by the surgeon, suffering humanity should no longer be annoyed by tentative, timid, palliative measures, but *primarily* receive that treatment from which, *finally*, the cure is obtained.

P. S. Sept. 1, 1875. At this date Mrs. P. remains exceedingly well in spite of much walking and other exercise of a *more injurious* nature; and physical examination per speculum, etc., shows a perfect condition of the parts, as at last report.

217 WEST 10TH STREET, NEW YORK, June 22, 1875.

[1] Surgery of the Rectum, London, 1871. His observations and experience, pp. 106, et seq., will afford the reader much interest and instruction.

ART. XIV.—*Large Multilocular Ovarian Cyst of long standing; Two Tappings; Ovariotomy; Veratrum Viride and Quinia in After-Treatment; Recovery.* By W. HUTSON FORD, M.D., (*lately*) of New Orleans.

MRS. E. D., of Attala County, Mississippi, an active cheerful woman, æt. 44; married in 1848, mother of eight children. Had a severe attack of measles, with consequent broncho-pneumonia, in March, 1849. Has suffered from cough and bronchorrhœa ever since. During last ten or twelve years, has had some uterine prolapse with leucorrhœa. Always menstruated regularly until within a few months back. General health hitherto good, the pectoral troubles excepted. She first noticed a tumour in the abdomen, in the summer of 1867, seven years ago. This gradually increased in size, though producing very little effect upon her health, and scarcely interfering with the usual avocations of a farmer's wife. Has not had any attacks of partial peritonitis, so common in these cases, nor any in the tumour itself, nor has she suffered from gastric disturbance or intestinal derangement. Within a year past, has been troubled with exacerbations of the cough, and increasing dyspnœa, attributable to pulmonary œdema and hydrothorax. Was tapped in linea alba in August, 1874; half gallon of dark, grumous, chocolate-coloured fluid obtained. There was no subsequent peritoneal inflammation.

I first saw her Sept. 20, 1874. Her girth was very great, and the surface of the abdomen traversed everywhere by large and tortuous venous trunks, testifying to the obstruction of the deep return currents. Nevertheless there was no œdema anywhere, not even about the malleoli, probably owing to the unusually slow growth of the tumour. When she was placed in the recumbent posture, the walls of the abdomen could be slipped about over the tumour freely—with the production of a very distinct friction-sound, similar to that which might be produced by rubbing a wet surface of glass with a piece of thin non-vulcanized caoutchouc. Deep fluctuation was well marked in several parts of the abdomen. Palpation determined the existence of several hard bosselated protuberances in different places, notably in the hypogastric and iliac regions. On striking the abdomen in the left iliac fossa with four fingers placed together, the blow being slight and quick and directed upwards, a wave of moving fluid could be very plainly *seen* to advance upwards to the stomach, and to be thence reflected from the surface of the viscera, or of the diaphragm, downwards again into both iliac regions. In view of these facts I diagnosed a non-adherent multilocular ovarian cyst.

On tapping, two inches to the right of the umbilicus and an inch below it, two gallons and a quart of chocolate-coloured grumous fluid was obtained. This tapping I did in the recumbent posture; it was followed by no inconvenience or accident whatsoever. The fluid gradually accumulating and the dyspnœa reappearing, I performed ovariotomy on the 23d of October, 1874, at 10.30 A. M., after the usual systemic preparation. I had, however, before this, caused her to take considerable doses of quinia and iron with digitalis for some weeks. No morphia, however, or other opiate was given, as has been recommended with a view to accustom the system, and stomach especially, to its use, for some days before the operation. The night before, she took fifteen grains of quinia, and at 6 A. M.

ten grains more. At the operation there were present Drs. G. W. Scarborough, of Kosciusko, Miss.; S. K. Coleman, of Canton, Miss.; Richard G. Gantt, Collins, and Mr. Dodson, medical student. Anæsthetization with sulphuric ether took about half an hour; once, a little chloroform was thrown upon the sponge, whereupon the patient vomited, and continued to do so, though not violently, for a quarter of an hour. Afterwards, however, the vomiting ceased, and she became unconscious; the pulse remaining very good, and the respiration full and free. Once, also, there was a sudden flushing of the face, which quickly passed off. I attributed all this to the chloroform, as she had experienced similar troubles in the first tapping, in which chloroform had been given. As the patient lay on the operating table, she measured seventeen inches from ensiform cartilage to pubic symphysis; and forty-one and a half around the abdomen through the umbilicus. The knife was entered two inches below the umbilicus, and a mesial incision made four inches long. The linea alba, being hit upon, was similarly incised. The peritoneum was opened and divided to the extent of the external wound. Thus far there was no hemorrhage, only a very little oozing. About two pints of ascitic fluid escaped on opening the peritoneal cavity, and the tumour presented fairly at the wound. I passed in my hand and found no adhesions save at the sites of the previous punctures made in tapping. The tumour was now tapped with Atlee's large trocar; about fifteen pints of dark chocolate-coloured fluid escaping. After the partial collapse of the tumour, on attempting to draw it through the wound, I found it impossible to do so, notwithstanding the apparent absence of adhesions. Tapping high up in the incision brought only an insignificant quantity of gelatinous transparent fluid, evidently from a young cyst. I therefore enlarged the wound by successive strokes of the knife from within outwards upon my finger as a director, until the wound was large enough for me to pass in my hand. Introducing my right arm nearly to the elbow, far up into the sub-diaphragmatic space occupied by stomach and spleen, and disengaging the mass which entirely filled this region, I drew downwards gradually into the orifice another full cyst, separated from the one first tapped by a hard mass of adventitious tissue, and entirely out of the reach of the trocar through the primary incision. As this unwieldy mass appeared at the opening in the abdominal walls, it was tapped adroitly by Drs. Coleman and Gantt without the least spilling of its contents into the abdominal cavity. The whole growth was now withdrawn through the wound (which was eleven and a half or twelve inches long), and was found to spring by a pedicle some three inches broad and not more than two inches long and a quarter of an inch thick, from the right broad ligament. The Fallopian tube was incorporated with the neck of the cyst. The pedicle being short, I determined to follow Macleod's method and twist it off. Accordingly an Atlee's improved clamp was applied to the pedicle quite up to the body of the uterus, and the pedicle cut off with the scalpel about an inch and a half beyond the clamp. The stump of the pedicle now left was divided into two parts with a bistoury, *i. e. split* in its middle line, and each half separately twisted off with a small hand vise, while an assistant held the clamp immovable. On removing the clamp afterwards, some little hemorrhage was observed, requiring a carbolized catgut ligature, and a few touches of the brush dipped in Monsell's solution. Presently, however, it became evident that arterial hemorrhage was going on, and searching along the line of the wound now extended along the broad ligament, a nodule of extravasation, as big as a large acorn, was

observed to have been formed in connection with the spermatic artery, which was seen to be bleeding pretty freely, notwithstanding the twisting. This hemorrhagic nodule was enucleated by the fingers, and the artery tied with a fine carbolized catgut ligature cut off close.

After all hemorrhage had apparently ceased, and the fluids contained in the abdomen removed as carefully as possible by the sponge, and dipped out of the right iliac fossa, the patient was gently rolled over on her right side, so as to allow any fluid loitering around the uterus and rectum to gravitate thither, the viscera meanwhile being gently held back by pressure upon the abdominal walls; the incision was then closed. I did not think it necessary to insert a drainage tube, though provided with various modifications of such apparatus, in view of the general absence of adhesions and little consequent danger of continued trickling of blood into the abdominal cavity. The wound was closed by quilled suture. Thirteen deep silver sutures were introduced by a hollow needle (similar to Keith's), and fourteen fine silken carbolized sutures were passed superficially. After some twenty minutes, the patient being still on the operating table, what seemed to be a small knuckle of intestine was observed two inches below the umbilicus, between two of the sutures. This was thrust by the finger downwards into the abdomen, the deep sutures near by tightened, and one or two additional superficial ones introduced. The line of the wound was smeared abundantly with styptic colloid, and a piece of lint smeared with carbolized cerate laid over its whole length. Across this, the line of sutures was fortified as usual by long strips of adhesive strap passing clear over upon the flanks. A wide bandage, well padded in the ileo-lumbar regions with raw cotton, completed the dressing. The patient was then put to bed. The whole time of the operation, including the etherization, was one hour and forty minutes. The tumour proved to be a multilocular cyst of the broad ligament. There was an almost countless number of secondary cysts. None of these had begun to suppurate, or contained any of the viscid, creamy matter so like pus, often found in advanced growths of the kind. The larger cysts contained grumous, chocolate-coloured fluid, such as was obtained by the tappings; the smaller ones, of the size of a pea up to that of an orange, with walls in some cases no thicker than writing paper, contained only transparent ropy matter. The fluids drawn from the cyst during the operation, in conjunction with the extirpated mass itself, weighed *thirty-eight and a half pounds*. Estimating the ascitic fluid which escaped at a pint and a half, the contents of the abdomen removed were not short of *forty pounds*.

The after-treatment may be briefly described as follows: In order to prevent septic infection, quinia in ten-grain doses was given by enema, morphia being freely given in this way alone. At 7.30 P. M., six hours after the operation, the pulse being at 110, the administration of pills containing two grains of quinia and two drops of Norwood's tincture of veratrum each was begun. This medication by quinia and veratrum conjointly, with occasional doses of morphia and some whiskey at night, was continued for the first ten days.

The cough with which she had been previously troubled for years, was a source of much annoyance to her and no little apprehension to myself; but it gradually became less violent. She was made sick by the veratrum once only; she vomited a little on the sixth day, and had some hiccough. This was, without doubt, partly due to the influence of veratrum, but I am inclined to attribute it in part also to the morphia and quinia. It

yielded readily to sinapisms and a little whiskey and water, ether, and hypodermic of morphia. On the fourth day she had distinct threatenings of septicæmic infection; this was met by enemata of quinia dissolved by Monsell's solution in water.

The wound healed wholly by first intention, excepting for one point of insignificant extent. The bowels did not move until the twelfth day. I did not remove the deep sutures until the eighth day. The following is the record of pulse and temperature:—

1st day, morning, operation; evening, 4 P.M. 88, 9.30 110.
2d day, morning, pulse 110, tem. 100°; evening, pulse 100, tem. 100°.
3d day, morning, pulse 74, tem. 100°; evening, pulse 82, tem. 100.5°.
4th day, morning, pulse 65, tem. 100.5°; evening, pulse 82, tem. 100.3°.
5th day, morning, pulse 82, tem. 100.5°; evening, pulse 80, tem. 100.5°.
6th day, morning, pulse 54, tem. 100° (this was the day of the attack of gastric veratrism); evening, pulse 84, tem. 100°.
7th day, morning, pulse 84, tem. 99.5°; evening, pulse 84, tem. 99°.
8th day, morning, pulse 82, tem. 100°; evening, pulse 76, tem. 99°.
9th day, morning, pulse 86, tem. 99°; evening, pulse 82, tem. 100°.
10th day, morning, pulse 84, tem. 100°; evening, pulse 88, tem. 100.5°.
11th day, morning, pulse 76, tem. 98.5°; evening, pulse 76, tem. 98°.
12th day, morning, pulse 76, tem. 98°; evening, pulse 82, tem. 99.5°. (Bowels moved of their own accord.)
13th day, morning, pulse 84, tem. 99.5°.

The highest reading of the thermometer observed was on the fifth day, at 1 P.M., viz., 101°. The highest pulse rate was 110, during the twenty-four hours following the operation. The highest rate of pulse observed after veratrum was begun was 100, the lowest 54 to the minute. After veratrum had been administered during twenty-four hours, the highest observed pulse rate was 95. The veratrum was steadily given night and day with great care, during nine days. The mean rate of pulse during this period, exclusive of the first twenty-four hours, was 81.5 per minute, as calculated from seventy recorded observations. I did not think it at all advisable to invite any motion by purgatives or enema. The bowels were left to themselves, and, being no doubt paralyzed, at once by the operation, by the subsequent inflammation, and by the repeated enemata of morphia, did not act until a late day. I think that some spasmodic contraction of the rectum was caused by inflammation in the retro-uterine cul-de-sac. The presence of inflammation here was indicated by pain attendant upon the exhibition of enemata.

In a previous case of ovariotomy (see No. of this Journal for July 1873), I did not use quinia so heavily, nor veratrum at all. From a long experience with the latter agent, I am led to believe that its use after this operation, if vomiting can be controlled or prevented, will very greatly tend to diminish the liability to peritonitis, while the exhibition of heavy doses of quinia will counteract the disposition towards septicæmia, especially apt to manifest itself where no drainage is provided for.

I am quite pleased with the employment of ether instead of chloroform. It is evidently a safer agent, and free from several disadvantages attaching to this latter substance. It does not produce vomiting, recovery from its effects is prompt, and it does not disorganize the blood or paralyze hepatic action as chloroform seems to do.

Nearly seven months have elapsed since the operation, and our patient is quite well; as active as before she was affected seven years since, and

free from all inconvenience. Her old chronic cough has almost entirely disappeared.

I think there can at this time be very little question as to the propriety of treating the pedicle by *torsion*. The day of the "clamp," it seems to me, is passed. If, however, a pedicle be broad, there is much danger of lacerating the coverings of the uterus, and unduly contusing the neighbouring peritoneum, if we attempt, as has hitherto been done, to twist off the whole pedicle at once, however securely it may be held. I therefore split it into two parts, and intend splitting it into three or even four digitations, twisting off each of these, one at a time, while they are all securely held by a proper instrument. I have devised a holder and twister, which I shall lay before the profession as soon as I have given them a trial.

CANTON, MADISON COUNTY, MISS., May 10, 1875.

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ART. XV.—*Extirpation of both Superior Maxillary, Left Malar, and Pterygoid Process of Left Sphenoid Bones.* By A. E. CAROTHERS, M.D., of Saltillo, Mexico.

THE excision of both upper jaw bones is an operation which has been so seldom performed, that its feasibility as well as its utility, as shown by the results obtained, must be a matter of interest to the profession. The following case, which occurred in my practice in this city, was so satisfactory in the latter respect, that I am tempted to present it to professional notice through the columns of this Journal.

Crecencio Zuñega, æt. 36, a native of Mazapil, in the adjacent State of Zacatecas, a miner by occupation, came to this city to consult me on July 30, 1873. His account of himself is, that he has worked principally in smelting works for the reduction of silver-bearing lead ore, and has suffered in consequence from the usual results of colic, paralysis, etc. He says he suffered from a suppurating bubo twelve years ago, which was treated with cataplasms, ointments, etc., but took no medicine internally; in fact, has never taken any medicine in his life.

He commenced suffering from pain in an upper molar tooth of left side one year four months ago, which gradually extended to all the teeth and upper jaw bones on both sides, accompanied by a discharge of fetid pus from the alveoli. The pain finally became so severe as to deprive him of rest, and cause him to seek surgical relief.

Upon examining him, I found marked "*wrist-drop*" of both hands, a condition very common among men of his occupation. The left side of the face was considerably swollen, pushing the nose to the right side of the median line, presenting on that side the appearance of "frog-face." The vomer was entirely absent, the teeth were loosened in their sockets, and the palatine arch was nearly filled by the swollen soft tissues. There

existed two fistulous orifices, one three-fourths of an inch below the outer canthus of the left eye, the other slightly below this, through which the necrosed malar and superior maxillary bones could be felt with the probe. Offensive pus was discharging from the nostrils, gums, and fistulæ.

On July 31st, assisted by Drs. Smith and Figueroa, I operated for the extirpation of the left malar and superior maxillary bones, making the incision recommended by Gross, from the margin of the nose below the inner canthus of the eye, carrying it outward parallel with the inferior margin of the orbit, through the upper fistula, to about the middle of the zygomatic arch, and slightly below it. Another incision was then made, connecting the two fistulous orifices, and continuing downward in an elliptical form to the angle of the mouth, dividing the cheek down to the bones. The bleeding in this incision was very great, it being necessary to ligate six branches of the facial artery enlarged by the inflammation of the parts. I then dissected up the gums, removed the teeth, and turned the flap up over the eyes, which discovered the bones very well. The malar was found to be free from bony attachments, and was removed by a wrench of the forceps, thus taking away the outer half of the floor of the orbit. I next freed the palatine process from the soft tissues of the roof of the mouth, pushing the handle of the scalpel along the bone to its posterior margin, from whence the palatine bones had been previously absorbed, and divided the symphysis between the maxillary bones with the bone-pliers, introducing one blade into the nasal and the other into the buccal cavities; when, to my pleasant surprise, I found considerable mobility of the bone, and, by the employment of forcible and careful manipulation, I was at length enabled to separate it and the pterygoid process of the sphenoid from their attachments, and extract them.

But, upon examining the cavity to remove such fragments as might have remained, the right superior maxillary was found to be in the same condition as the one extracted, and I proceeded to extirpate it also. Desirous of avoiding a greater loss of blood, which had already been immense, I determined to attempt its removal through the opening already made; to effect which the attachments of the gums to the alveoli and of the right cheek and nose to the bones were freely dissected up, and the flap drawn over the right side of the forehead as far as possible, the angle of the mouth being held outward and upward by the finger of an assistant, being greatly aided in this part of the operation by the absence of the vomer, which left the nose perfectly flaccid. The soft tissues of the palatine arch were then dissected away, the bone grasped with a strong forceps, and an attempt made to wrench it from its attachments, but it was still adherent in parts, the necrosis not being so complete as in its fellow, and it was necessary to use freely the pliers and chisel to effect its separation, which being completed as far as possible, the greater part was removed entire, and the rest subsequently in fragments, by the use of the gouge-forceps and gouge, care being taken not to leave any particle that showed signs of disease. On this side the orbital plate and the nasal process to the level of the infraorbital foramen were found to be sound, and were not disturbed, all the rest of the bone being either removed entire or subsequently gouged away.

Chloroform was administered at the outset of the operation, and the patient was under its influence while the preliminary incisions were being made, but the danger of strangulation from the great amount of blood poured out, the entrance of which into the throat it was impossible to

prevent, necessitated its suspension, and all the subsequent steps of the tedious and painful operation were borne in the full consciousness of the patient.

Considerable trouble was caused by hemorrhage from the anterior palatine artery, but it was finally controlled by filling the cavity with charpie saturated with liq. ferri subsulph. When all bleeding had ceased, the lint was removed, the cavity carefully cleansed, and the external wound closed with silver wire sutures; care being taken to establish a communication with the cavity through the lower of the two external fistulous orifices, into which the nozzle of a syringe could be introduced for the purpose of dressing, which was found very convenient in the subsequent treatment of the wound. It was then dressed with carbolic-acid water, ʒj to Oj, and the same solution was freely injected into the cavity several times daily. On the third day the wound was red and swollen, looking very much like an incipient case of erysipelas, and I ordered the addition of Goulard's extract of lead to the dressing, and gave tr. ferri chloridi gtt. xxx every four hours, under which treatment the wound soon regained its normal appearance. On the sixth day the ligatures came away, the wound being by this time firmly adherent, except at the points where the ligatures kept it open, which soon closed.

Up to the twelfth day the wound was supported by strips of adhesive plaster and a bandage, but on that day I removed all dressings, the wound being entirely cicatrized except at the orifice before referred to, which was kept well open by the insertion of a roll of lint.

The palate contracted adhesions with the opposed tissues of the upper lip and cheek, and was not so much retracted as would have been supposed from the size of the cavity. From the first the patient could swallow liquids, and could speak sufficiently distinctly to render himself intelligible, and continued improving, so that by the tenth or twelfth day he could eat meat cut fine and tortillas very well.

Nothing noteworthy occurred in the subsequent history of the case; the cavity continued filling up, deglutition and articulation steadily improved until November 19, 1873, when I met the patient in the street and had a photograph taken, after which he returned to his home.

I have heard from him at intervals since then; he continues in good health, and is earning his own subsistence. Comparatively little deformity resulted from the operation, though of so grave a character.

I am well aware that the removal of a necrosed bone is a much easier procedure than the same operation on a bone affected with a diseased growth, as an epulis, a sarcoma, or an encephaloid tumour, and I am also aware that I did not remove the *whole absolutely* of the right bone, still the operation may be of interest, from its rarity.

Prof. S. D. Gross, of Philadelphia, in a letter to me on this subject, of September 21, 1873, says that "the greater portion of both upper jaws were removed in 1824 by Dr. Rogers, of New York, and I am not aware that these bones have ever since been completely excised by any American surgeon," and my friend, Prof. S. B. Ward, of New York, writes me, October 13, 1873: "The first time this operation was *ever* performed was by Dr. David L. Rogers, of this city, in 1824, since which time it has been repeated by Parker, Carnochan, and James R. Wood twice, and in Europe

by Dieffenbach, Maisonneuve, Heyfelder three times, and others. Parker's case was that of a Norwegian sailor at the New York Hospital, with a myeloid tumour involving both bones, and was successful. Wood's two operations were for phosphorus diseases of both bones." Mr. Lane reports in the *Lancet* of January 25, 1862, a removal of both superior maxillary bones in 1861, on account of albuminous(?) sarcoma. These are all the cases of this operation that I have been able to collect. I believe, however, that few of these gentlemen claim to have removed absolutely all of both bones, and that they did not leave some portion of the orbital plate, or some piece of the nasal process; but that fact does not detract from the credit due them for this important innovation in conservative surgery any more than did the loss of all of his seven cases detract from that due Larrey for originating the hip-joint amputation, or from Mott, for the operation for innominate aneurism, because his successes were only partial.

The fact that I was enabled to remove both bones through the incision on one side of the face, also serves to lessen the gravity of the operation, the loss of blood being much less than when both cheeks are divided, as recommended by surgical writers, especially as in this case the side presenting the greatest difficulties was that opposite to the incision.

The operation will, of course, be more satisfactory in a country like the United States, where modern mechanical skill does so much toward repairing the ravages of the surgeon; but in my case neither the circumstances of the patient nor the resources of the country admitted of any such attempt.

SALTILLO, MEXICO, August 17, 1875.

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ART. XVI.—*Stricture of the Urethra in the Female, and its Treatment by Electrolysis.* By ROBERT NEWMAN, M.D., of New York, President of the Northwestern Medical and Surgical Society.

JUDGING from the scarcity of the literature on the subject of stricture of the urethra in the female, the conclusions would be, that such a pathological condition is of extremely rare occurrence. Little of practical application is found in our best text-books. Even the extensive writings of the most eminent specialists are nearly silent on the subject. Scanzoni does not mention it; Thomas, in his fourth edition, says nothing about the matter. Neither do Bumstead, Niemeyer, Dittel, Gouley, nor Van Buren and Keyes. The latter two, in their extensive work on the surgical diseases of the genito-urinary organs, including syphilis, are silent on the subject.

The medical literature to which I have access, including the medical

periodicals of both Europe and this country, have been searched, and but few cases were found to which attention can be called.

Boucher, in the *Gaz. des Hôp.* No. 16, 1865, reports one case, cured by gradual dilatation. Boehm mentions another in *Berlin Cent. Zeitung*, No. 84, 1868. It was a traumatic injury, the stricture depending on direct accident, produced by a splinter of wood. After two years of intense suffering, the patient is reported cured.

Dr. Gross dismisses the whole question by saying: "The female urethra is rarely diseased. The principal lesions are strictures, etc. etc." Not a word, however, about its diagnosis, treatment, or anything relative to that pathological condition. Dr. Gunning S. Bedford says: "Stricture of the urethra in the female is extremely rare," and cites one case. Velpeau, in his great work, cites only three cases, *en passant*. Holmes, in his exhaustive work on surgery, is comparatively silent on the subject under consideration. Ashwell, Simpson, and many other writers say nothing about this disease.

In my practice a small number of such cases have occurred, but during the last eighteen months the unusual number of four well-defined cases of stricture of the urethra in the female have come under my observation and treatment.

Stricture of the male urethra has been successfully treated by electrolysis, and the favourable results of the method have strictly fulfilled the ideal demands of its theory, and, on the whole, the results having surpassed the most sanguine expectations, no valid reason could be adduced why electrolysis should not accomplish the same in stricture of the female urethra. Hence, the purpose of this paper is to tabulate the clinical facts, and to bring to notice this class of troublesome ailments, which certainly are of more frequent occurrence than the authors and specialists lead us to infer from their writings. The subject becomes pertinent at this time, because of the controversy which is just now going on between the exponents of the different plans of treatment, each urging his particular views on the attention of the surgical world.

The following four cases from their history and subsequent success will show the efficiency of what may be considered a new operation. They were of long standing and complicated with other diseases, and therefore less favourable.

The differential diagnosis being an important factor for the successful treatment, endoscopic examination is of the utmost value. To examine the urethra not merely through the sensation obtained by the touch, but also by vision, is an advantage so self-evident, that little need be said in favour of its employment. In the cases under consideration the endoscopic examination was made.

CASE I. *Tertiary Syphilis; Indolent Ulcers on Leg; Stricture of the Urethra; Electrolysis; Cure.*—Feb. 12, 1873, Mrs. M. R., æt. 35, widow,

a clandestine prostitute, very obese, calls at the office; is suffering from indolent ulcers on foot and leg. One foot is swollen, œdematous, sore, inflamed, red, and very painful; on anterior aspect of foot and over the tibia are large and deep holes reaching down to the bone, surrounded by ragged edges and boggy tissue. The indolent ulcers discharging foul, unhealthy, ichorous matter, which burrows through the adjacent tissue. The periosteum of both tibiæ is thickened, excessively painful and sensitive to the slightest touch, particularly at night. Other bones are similarly affected, especially those of the cranium. Adenitis, syphilitic dyscrasia. A minute history could not be ascertained, but she admitted primary infection, and the present symptoms are so well marked as not to be misinterpreted. She made the reluctant admission, that she has been for some time under treatment for the ulcers on her legs, which heal sometimes, but invariably break out again and again.

She passes water only in a small stream, with intense pain, and succeeds in slowly emptying the bladder only after much straining.

*Examination.*—The urethra is found to be contracted and of small calibre. The meatus is deeply seated, and recedes behind the pubes on the slightest touch, inverts and rolls upon itself; this, no doubt, depends, in part, upon her obesity, and therefore difficulty is encountered in the introduction of a flexible bougie. Then a whalebone bougie à boule entered only partially, and met with a hard contracted stricture, conveying a parchment feeling to the fingers and arresting the bougie at three-fourths of an inch from the meatus. The attempt to introduce a short steel sound, with the hope of dilating the stricture, failed; the manipulation caused so much pain, that no further means were employed, for the present.

Believing that the stricture was wholly dependent on the syphilitic condition of the patient, and would yield to general constitutional treatment, all local measures were deferred. A specific treatment was at once pursued, and in the course of two months she took two ounces of iodide of potassium. The ulcers were dressed with adhesive plaster and rollers; using even compression.

*April* 15. The ulcers have disappeared; legs are covered with healthy skin. No symptoms remaining indicating the former disease. The bones have lost their former acute sensibility, which had caused her so much suffering. She appears to be cured of the constitutional disease. On examination, the stricture of the urethra is found, contrary to expectation, to be in the same condition as before, and local treatment was commenced. The exploring bougie imparts to the finger the sensation of passing over a substance like parchment. A No. 5 sound passes into the stricture nearly one inch from meatus, and there is tightly grasped. Dilatation was perseveringly tried without any appreciable effect.

22*d.* Electrolysis. The positive pole of a Drescher 20-cell galvanic battery with sponge electrode was held in the palm of the hand of the patient. To the negative pole a No. 8½ olive-shaped metallic bougie was attached, the extremity of which measured number six; this was introduced into the meatus. The galvanic current was then gradually increased up to 10 cells. The bougie slowly and gradually advanced, and after two minutes passed into the bladder. Immediately afterwards a No. 1. bougie was introduced in the same manner as before, with a like favourable result. The whole operation was completed in five minutes.

26*th.* The patient reports herself better in every way, and is much improved, has no pain, nor does she suffer from any difficulty in micturating since the galvanic application was made.

*May* 14. Electrolysis. Nine cells of the same galvanic battery were used in the same manner as on the previous occasion. A No. 13 bougie enters the urethra gradually and with perfect ease. The current was kept up for ten minutes.

31*st*. The patient reports herself well, and expresses much gratification at the favourable result of the treatment. She is kept under observation; and on

*October* 31, 1874, I made a careful examination again, and found the urethra completely restored. The cure must be considered perfect, as seventeen months have elapsed since all treatment has been left off, and the patient had no relapse nor the slightest urethral trouble of which to complain.

This case has many interesting features; not the least is the fact that this patient suffered for years from syphilis. The stricture did not yield after the otherwise successful constitutional treatment; and, while all the symptoms of syphilis left her during the two months of the specific treatment, no effect whatever on the stricture was observed. It was only when galvanism was employed that the stricture of the urethra yielded. No doubt can be entertained that electrolysis, and nothing else, cured the stricture.

CASE II. *Granular Urethritis; Stricture of the Urethra; Retroflexion of the Uterus; Endoscopic Examination; Galvanism; Cure.*—May 15, 1873, Mrs. M. D., æt. 32, married three years, has one child two years of age. Menstruation, as a rule, regular, but occasionally appears prematurely, lasts six days, and is accompanied by menorrhagia. Is anæmic and of nervous temperament. Has a frequent desire to micturate, with vesical tenesmus. Complains of a peculiar pain, which appears to be due to some spasmodic action of the urethra. The urine occasionally contains blood. Sleeps well at night, and is not then troubled with any of the above symptoms. She passes water six or seven times a day in a small stream; urine is acid and free from albumen; some epithelium; nothing peculiar, however, is discovered in the urine; passes from three to four pints of urine in the twenty-four hours; pulse, 88; temperature, 101. For this very interesting case I am indebted to Dr. A. Murray of this city, who kindly sent her to me. On examination of urethra and bladder by whalebone bougie-à-boule, she feels a slight irritation but no pain.

20*th*. Endoscopic urethral examination. A small No. 10 tube enters the meatus, encountering a stricture at seven-eighths of an inch from its entrance. The whole tract of the urethra is in a state of irritation, and at some points granulating surfaces are discovered, which were touched by Desormeaux's solution, of one part of nitrate of silver in three of water.

24*th*. Urethral electrolysis with No. 11 metallic bougie at the negative pole; the sponge electrode of the positive pole held in the palm of the hand of the patient, 8 cells of Drescher's battery were used. The galvanic action produces by degrees a soothing effect by its chemical action. The bougie enters, and, after four minutes of the galvanic application, the stricture itself is penetrated, and an entrance to the bladder effected. The uterus is replaced with the uterine sound. Quinia and tonics are prescribed.

27*th*. Urethral galvanization as on the previous occasion. The bougie

electrode enters the urethra easily; no pain or inconvenience is felt during the operation. Uterus replaced as before. Quinia and tonics continued.

30*th*. Urethral granulations at one inch and at an inch and a quarter from the meatus, to which Desormeaux's solution is applied. The appearance of the urethral walls very much improved. The patient feels better in every way.

*June* 6. Treatment as before. A No. 13 bougie now passes readily through the whole tract of the urethra and enters the bladder without the slightest difficulty or inconvenience.

13*th*. Menstruation was expected on June 2d, but has not appeared. Feels nausea in the morning, and suspicions of pregnancy are entertained. The solution of nitrate of silver was applied through a tube to the granulations of the urethra.

26*th*. Galvanism, bougie No. 13 passes easily along the whole of the urethra into the bladder. Granulations have disappeared; urethra has now a normal calibre; she reports well.

October 14, 1874, sixteen months after treatment, Dr. Murray writes:—

"After some trouble I was able to get some information regarding Mrs. D.'s case. I have been informed that your treatment made a complete cure. She has removed to Illinois and had a young son lately," etc.

CASE III. *Stricture of the Urethra; Urethritis; Electrolysis; Cure.*—April 24, 1874. Mrs. M. G. M., æt. 44 years, widow, the mother of six children, had the last child eleven years ago. Seven abortions, the last fourteen years ago, at ten weeks. This lady has been my patient several years; was treated formerly by me for dysmenorrhœa, menorrhagia, and metritis; has enjoyed pretty good health for several years. She now complains of frequent micturition; at one time she suffers from enuresis, at others she is afflicted with dysuria. Complains of soreness and pain in micturating; considerable urethralgia is present, as indicated by the burning and scalding sensation after the act. Endoscopic examination reveals an extensive inflammation along the tract of the urethral canal. The mucous lining is swollen and thickened, and of a dark red colour. Along the walls is loose epithelium, and a circumscribed ulcer is observed, very painful to the touch, and three-quarters of an inch from the meatus urinarius the stricture is seen and felt. A No. 6 bougie passes with some trouble, and transmits to the finger a feeling which very much resembles that of running over paper. The ulcer touched with Desormeaux's solution—argent. nitrat. 1 part, aqua 3 parts. No pain is caused by this application; on the contrary, she expressed relief from it.

*May* 1. Electrolysis. Positive pole, with sponge electrode attached, grasped in the palm of the hand of the patient. To the negative pole is attached a bougie No. 12, and introduced into the urethra. This operation causes a little soreness, which is no doubt due to the morbid sensibility of the canal and its inflammatory condition. Nine cells were used during four minutes, when the bougie easily, slowly, but gradually passed through the stricture, and entered the bladder. It may as well be here remarked, that the nine cells were used gradually up and down. After the circuit is completed, and stands at 0, it is gradually increased cell by cell until the current produces a feeling of warmth and a slight pricking sensation. All this time the electrode is working its way through the obstruction, causing no pain, which should always be avoided. When the operation is finished, the current is decreased by drawing the slide back, until it stands at 0 again. At the expiration of the four minutes all pain

ceased, and the bougie could be freely moved in all directions without causing the slightest pain or inconvenience.

5*th.* Improved in every respect. Micturition not exactly normal yet; still, the desire to pass water is not so urgent as before the operation, and she retains it for a longer period. Electrolitic treatment is repeated in the same manner as on previous occasion. The No. 13 bougie was replaced by a No. 12. Eleven cells were employed during eight minutes. A marked improvement is observed; there remains but little sensitiveness at the meatus urinarius.

8*th.* A slight application to the sore spot in the urethra with Desormeaux's solution was made through a glass tube.

12*th.* Same treatment as before with a No. 12 bougie; eight cells during seven minutes. She complains of a little sensitiveness at the meatus on the introduction of the bougie. After the galvanic application the catheter was introduced, causing no pain, nor the slightest unpleasant feeling. The urethra, after careful exploration, is found in good condition, and the patient feels well.

15*th.* The urethra and bladder, after examination, appear well. The patient complains of no inconvenience. She says that she is well, and that there is no trouble left.

*June* 1. The patient has not been troubled since the last *séance.* Galvanism used during five minutes, seven cells. No. 15 bougie enters the urethra and bladder with facility. Patient is well, but kept under observation.

One year afterwards enjoys good health, without having had the slightest relapse.

CASE IV. *Stricture of the Urethra; Fibrous Band and partial Urethrophraxis; Electrolysis; Cure.*—July 7, 1874. Mrs. J. C., æt. 28 years, widow. During the last two years has been troubled with difficult micturition, and now can only succeed in the erect position. The act even then is performed with great difficulty, and the water voided in a very small stream. At times she suffers from dysuria, notwithstanding the urgent desire to micturate. To all this is superadded spasm of the bladder, producing most agonizing pain. She believes that some two years ago she contracted blenorrhœa, which was communicated to her by her husband, and for which she received appropriate treatment. For a long time she was under the care of a physician, who injected into her urethra a strong solution of nitrate of silver, which gave her great pain. The difficulty has gradually increased until now, when she is almost powerless to void urine. It may be fairly asserted that the cause of this stricture was the caustic injection used. Simple urethritis may create a stricture just as well in the female as in the male; but in the former will not cause such a degree of urethrophraxis as we find in this case.

*Examination.*—The meatus urinarius is very small and contracted, high up in the vestibule, and can neither be seen nor defined by the touch—in fact, almost obliterated. Bougies of different sizes and forms were tried, but no entrance of the urethra could be effected. A small No. 1 could not be introduced; it was almost a case of atreturethria. Fortunately I found in my armamentarium an extra small sound, which had been manufactured for the special case of a male infant. After a long and patient manipulation an entrance was effected with it. Then electrolytic application was made in the same manner as in the previous cases. A No. 6 metallic olive-shaped bougie was pressed with its smaller extremity

against the meatus urinarius. The statement "pressed against the meatus" is meant literally, as even the pointed *small* extremity of the olive-shaped bougie could not enter the meatus. Eleven cells of the galvanic battery were employed during five minutes. The bougie made but slow progress, still it steadily advanced till it had penetrated to half an inch from the meatus, where a fibrous band was distinctly felt, stretching across the urethra, and a true urethrophraxis was made out, which no doubt acted mechanically as an impediment to the flow of urine. By degrees this obstruction was overcome by the galvanic action and electrolytic absorption. I will not attempt here to describe how such absorption is effected, as the theory of such electrolysis, the physiological effect of electrolysis on mucous linings, the therapeutical action, the method of application, experiments and cases, have already been described in a paper read before the Medical Society of the State of New York in 1874, and published in advance of the *Transactions*, in the *Archives of Electrology and Neurology* for May, 1874, to which I refer. Another distinct stricture was found at the end of the urethra, an inch and a half from meatus, just where the canal emerges into the bladder. After the operation the patient complained of soreness in the urethra, and a feeling as if there was a substance which wanted to pass off. Two days subsequently there emerged from the urethra a carneous plug, so well described by Mr. Cullier. The urethra being relieved from this obstruction, the immediate result was very gratifying to the patient, and she at once passed a large and full stream of urine, without pain or any difficulty whatever, which she had not done for years before.

13*th*. A little urethral soreness is complained of, a mild galvanic current is applied, five cells for three minutes, during which a No. 9 bougie with metallic end is passed through the whole extent of the urethra, and entered the bladder without the slightest impediment or difficulty.

20*th*. Galvanism. Bougie No. 11 enters the meatus urinarius with difficulty. By patient manipulation and the avoidance of all force or pressure, the progress of the bougie entirely left to the electrolytic action, an entrance is effected. The difficulty, which is here experienced, evidently does not depend on the want of urethral calibre, but is entirely due to contraction of the meatus. To facilitate the entrance of the urethra in this case, choice was made of the olive-shaped bougie, which is selected in cases of the female urethra, or at the meatus of the male urethra, when the progress of the instrument can be seen, and felt, and guided by the finger. The advantage lies in the extremity being pointed, and several numbers smaller than the principal part of the bougie; this small point will pave the way for the larger full size, and thereby makes more progress in one *séance*. But this very same point is dangerous in deep-seated structures, when it cannot be guided by sight and touch, and may make a false passage. For this reason I prefer, as a rule, the egg-shaped bougies, and can operate with the latter with more safety.

*August* 20. Some difficulty is still encountered. The principal obstacle is at the meatus, but yields much sooner, and is overcome with less trouble, than in former attempts.

*September* 1. Galvanization, in the same manner as in former *séances*, with olive-shaped bougie No. 15. The remains of the fibrous bands are distinctly felt at half an inch from meatus, and obstruct the entrance of the bougie, but the obstacle is soon overcome by the electrolytic action. No further trouble is experienced. The urethral calibre is large enough

to permit a No. 15 bougie to slip through the canal into the bladder, without the slightest difficulty or inconvenience.

*7th.* A large sound passes easily.

Patient reports well.

The lady has been kept under observation to date, and remains well. The cure is complete and permanent of what may be called an unusually bad stricture. Five operations were necessary, before a satisfactory result could be recorded. The intervals between successive operations were shorter than the time that is usually advised in the case of males. But many of the objections against too frequent operations in males are met. Because it will be observed that a somewhat modified, and indeed a very mild current was made use of, and for a short time. It is surmised that the peculiar process of the electrolytic action, both chemical and mechanical, depends much on this mode of application of galvanism.

It is well known that the chloride of zinc has a great affinity for the albuminoids and gelatines. Now the mucous surface from which this bridle took its origin, being of an albuminous nature, the zinc-pole acted by the well-established law of chemical absorption, the albumen being absorbed, the deposit was detached from the walls of the urethra; the carnosity lay loose in the urethra, and was expelled by the *vis-à-tergo* of the urine. That this plug was the product of the electrolytic action of the galvanic battery appears to be absolutely certain.

A report of the following case of spasmodic stricture is added in order to show the differential diagnosis and treatment between true and spasmodic stricture, and also the importance of discriminating between organic and spasmodic strictures.

CASE V. *Spasmodic Stricture of the Urethra; Rectal Ulcer; Endoscopic Examination; Electrolytic Treatment; Cure.*—July 9, 1873. Mrs. M. K. æt. 29 years, the wife of a labourer, married four and a half years; three and a half years ago she aborted at three months; dates her trouble from her miscarriage, previous to which she enjoyed invariable good health. Before she came under my notice, she had been under the treatment of some eminent gynæcologists, for oophoritis, pelvic abscess, cystitis, etc. She now complains of pain in and along the whole urethral canal, particularly after micturition. There is complete retention, after scanty menstruation ceases. She passes but little urine, about one quart in three days, and during the last twelve hours three ounces is the whole amount she has passed. She is nervous and hysterical; bowels are nearly regular; urine almost normal, acid reaction, no albumen; phosphates are present, but in small quantity, a little flocculent deposit in phial. Microscopical examination reveals nothing abnormal. Ordered a diuretic emulsion.

She thinks, that the last medicine caused a desire for frequent micturition, and she has to void it every ten minutes. She discontinues the medicine, enuresis is arrested, and she micturates without difficulty. The previous symptoms are gone.

*Examination.*—Uterus normal in every respect. The sound meets at first with a little spasmodic resistance, but in a few moments enters the uterine cavity in a normal direction up to two and a half inches. On

examination some capillary congestion is discovered at the meatus urinarius, which is found red and highly sensitive. The calibre of the urethra is narrowed, the sound is spasmodically grasped on its entrance. After dilatation, a glass tube No. 10 enters with some difficulty, causing a little bleeding. Light thrown into the urethra reveals an inflammatory condition of the parts. No granulations are discovered, but a circumscribed spot is seen denuded of epithelium. This was touched with Desormeaux's solution, causing no pain or inconvenience.

21*st*. The catamenia have appeared

26*th*. Patient is very hysterical; complains of a multiplicity of ills, viz., throat, irritation of the bladder, flatus, rectal pain, violent lumbago, etc. etc. Urethral galvanization. Bougie No. 11 as negative pole, enters without the least difficulty at once. As soon as the galvanic current entered the body, all pain ceased at once.

31*st*. Increased hysterical symptoms. Examination with anal speculum reveals small internal hemorrhoids.

*August* 2. Endoscopic examination. A large rectal exploring tube entered the rectum with ease up to 3½ inches, at which distance it is arrested. There the patient complains of pain, and, to use her own expression, says: "Ah! doctor, I am confident that there is the origin of all my trouble." The ocular inspection per endoscope reveals an ulcer at 3½ inches from the sphincter ani, on the left side of the rectum, which on the slightest touch bleeds. Desormeaux's solution of nitrate of silver applied to the ulcerated surface, which immediately controlled the bleeding. No pain was caused by the application; on the contrary, relief is at once experienced.

12*th*. She reports herself well. On examination the rectum is found in a healthy condition; the ulcer has disappeared; so has the stricture of the urethra. The patient is much gratified, as she considers herself perfectly cured.

The value of endoscopic examination is here proved beyond a peradventure.

This stricture was spasmodic, and wholly dependent on the pathological condition of the rectum, because, it will be observed, as soon as the ulcer was discovered, and the source of irritation removed by appropriate treatment, all the bad symptoms ceased, and immediate relief followed. One point should be noticed, viz., the soothing effect of the galvanic current. Galvanization has powerful anodyne properties, as evinced in the above case, all pain having immediately subsided as soon as the patient came under its influence.

While it is conceded that the principal effects of electrization are tonic and stimulant, nevertheless there can be no doubt that this agent may be classed among the calmants and sedatives.

The early writers on electro-therapeutics speak of its sedative properties. The experiments of Onimus, Le Gros, Althaus, Meyer, and others have confirmed this. Hiffelsheim concedes the tonic and stimulating effect of electrization, but asserts and maintains that the current may become sedative in the same manner as those remedies which are classed among stimulants and tonics under certain circumstances become sedatives. The

further deduction drawn from the preceding case is, that galvanism here acted as an anodyne or sedative; that its therapeutical effect was such as to render it nearly positive; that the sudden and immediate relief from pain may be ascribed with professional certainty to its soothing action. Of course it is not to be understood that *all* ulcers will become amenable to the same treatment, nor heal by the same means; some will assume an indolent character, depending on many causes; still, may not the principal reason be found in the fact that the pain which they produce acts as an irritant on the margin of the ulcerated surface, which is thus kept in constant involuntary vibration, a condition observed in the ulcerated surface of the sphincter or anal fissure. In these cases opiates or sedatives are exhibited in small doses. These accomplish the same thing as galvanism, by giving rest to the nervous system. The pain being relieved, the healing of the ulcer is certain.

Galvanism here is both sedative and soothing in its action on the ulcerated surface.

*Conclusions.*—By grouping and recapitulating these cases as they appear in my case-book, the following conclusions may be drawn.

Five cases of stricture of the urethra in the female, viz.:—

One spasmodic stricture (not a stricture in reality), Case V.

Four real organic strictures, of which two were inflammatory, Cases II. and III.; and two were fibrous, Cases I. and IV.

As to causation, as far as the history of each case could be ascertained, it was as follows:—

Case I. was due to syphilis.

Case IV. was due to irritating injection in gonorrhœa.

Case II. was due to granular urethritis, a sequel of confinement, and probably aggravated by the displacement of the uterus.

Case III. was due to urethritis.

In Case V., the spasmodic stricture was due to reflex irritation, induced by ulcer of rectum.

The *seats* of the strictures were respectively: at the meatus—one-half inch—three-quarters of an inch—seven-eighths of an inch distant from the meatus; one case involving almost the whole urethra. These facts seem to prove that a stricture in the female urethra may appear in any part of the canal.

In the measure of severity they range from the slight diminution of the calibre up to almost complete atresia.

Now as to the *treatment*. It is claimed that electrolysis, and nothing else, cured the patients with organic stricture whose cases are here under consideration. Each case had received its appropriate treatment, and failed. When electrolysis was called upon, it succeeded. It is, therefore, absolutely certain that the last was the only factor which can be taken into consideration, and to which these cures can be reasonably ascribed.

This agent, tried by the severe tests and scrutiny of experience in strictures of the urethra, takes, therefore, a prominent place among our most useful agents. Indisputable statistical facts constitute the data upon which the opinion favourable to that kind of treatment has been formed. In three of the above recorded cases electrolysis was the curative agent which accomplished what specific medication had failed to do. Now, it might be argued, and that with some show of reason, since the female urethra is easily dilatable, that simple dilatation, if used diligently, would accomplish more and in a better manner than is claimed for electrolysis.

To this argument there are many answers; but the most perfect would be, that while the urethra in its *normal* state is easily dilatable, and in many case we might be able to introduce the finger deeply, even reaching the fundus of the bladder, it is quite another affair when the urethra is in an abnormal condition, such as inflammation, fibrous bands, and even atresia, in which the dilatation becomes impossible. However, while objection to the treatment of strictures of the urethra by galvanism may be made, and will, of course, receive all the consideration to which they may be entitled, it nevertheless illustrates, in the cases here recorded—

1*st*. That other means had been tried and failed.

2*d*. That electrolysis did cure strictures varying in calibre from No. 1 to No. 8, effectually and permanently.

The certainty of the permanence of cure depends on the fact that the patients so treated were kept under observation, have remained well up to this date, and none have suffered a relapse.

Galvanism as a therapeutical agent is daily receiving a considerable amount of favourable consideration from the profession; still it has scarcely obtained, I think, the credit it really deserves. Much of this appears to depend on its use in cases where experience has shown it to be ill adapted for its exhibition, and where failures are recorded, in all probability the cases were improperly diagnosticated or selected.

In conclusion, no apology need be offered for bringing a class of troublesome ailments to the consideration of the profession, which certainly are of more frequent occurrence than the scarcity of recorded cases would lead us to suppose; and if this paper has added a practical thought to the general knowledge of that distressing pathological condition called stricture of the female urethra, or if it should induce others to investigate the subject, I am amply rewarded.

No. 145 WEST 47th ST., NEW YORK, May, 1875.

ART. XVII.—*Double Popliteal Aneurism; Ligature; Flexion.* By EDWARD T. CASWELL, M.D., Surgeon to the Rhode Island Hospital.

THE following case presents some points of interest, and may, therefore, be worthy of record. The early history is not to be ascertained with definiteness:—

John H., Irishman, single, dairyman, aged 28, was admitted to the hospital September 6, 1874, with a pulsating tumour of the size of an orange in the left popliteal space, and another as large as a horse-chestnut in the right. The patient had been aware of the existence of a "bunch" under each knee for an indefinite period. They had not produced pain, nor had they caused him any inconvenience. He cannot identify any time or circumstance when his attention was first directed to them. On July 3, 1874, at 11 A. M., as he was driving cows to pasture, he felt a sudden severe pain in the left knee, causing him to sit down on the ground. On examination he found a bunch, the size of a large marble. He got home, and in two hours was seen by my colleague, Dr. Millar, who found the tumour in the left space larger than an egg, and one very much smaller in the right. The left leg was bandaged from the foot, and flexed upon the thigh to such a degree as would interrupt the circulation, without completely stopping it; and cold applications were made to the knee. This treatment seemed satisfactory. The size of the tumour diminished, and the pain disappeared. In two weeks he was able to be about his house, and dismissed his physician. He resumed work for a month, feeling no pain in the limb. One night, in the third week in August, he went to bed feeling as well as usual, and was aroused at 2 A. M. by an intense, heavy pain in the left knee, which continued until 6 A. M. He found he could not get up. He was again seen by Dr. M., who discovered that the tumour "filled" the popliteal space. The leg was again flexed upon the thigh, as before, without, however, producing any amelioration of the pain, or diminution of the tumour. In this condition he was admitted to the hospital, under the service of Dr. Carr.

The record states, that up to the 9th of September the only treatment was bandaging from the toes to the trunk, and cold applications, which at first seemed to relieve the pain. Compression upon the artery was then made by Briddon's compressor, with the instruction to change the position of the pads frequently. The instrument was with difficulty kept in place, and he was unable to bear the pain which it produced if it was applied for any length of time. Large anodynes were administered. He continued in this way, without further interference, until September 24, when, as the tumour was growing larger, an attempt was made to produce partial compression by the same instrument. This he could bear for several hours at a time, but it seemed to produce no favourable effect upon the aneurism; and the œdema of the foot, which had shown itself a few days previously, was on the increase. The attempt to cure it by compression, either partial or complete, was therefore abandoned; and on the 28th of September the femoral artery was tied at the lower part of Scarpa's triangle by my predecessor in service, Dr. Clapp, as Dr. Carr was ill at the time. After the artery was tied all pulsation in the tumour ceased. The temperature of the foot and leg diminished materially after the lapse of three or four hours, and hot sand bags were applied. Mor-

phia was given in sufficient quantities to control the pain, which was now referred partly to the popliteal space, and partly to the line of the incision. The wound healed by the 5th of October; the ligature came away on the 24th of that month. The tumour had not diminished in size to any extent since the first two or three days after the operation. The measurement in circumference over the patella was 18½ inches.

I will not follow the details of the hospital record; suffice it to say, that the tumour did not diminish materially in size. There was a feeling of semi-fluctuation, and the exploratory trocar was introduced two or three times at intervals, with and without the aspirator, and brought nothing but a little sanious fluid. The pain was severe, and abscesses formed in the leg and on the heel, which were opened. On the 31st of December the tumour broke, and discharged about two ounces of bloody fluid; it had previously diminished in size, so that the measurement was 17¾ inches.

The next day I entered upon my service, and found thick, grumous matter escaping from the opening. By the 5th of January this discharge was mingled with pure pus and clots of blood. The patient's condition was very unpromising; he was much emaciated, and had night-sweats. The opening was enlarged, and the discharge was very profuse, and of pure pus. Under supporting treatment, however, he began to improve, and gradually the tumour disappeared. He regained health and strength, so that by the middle of February he was able to be about the ward on crutches, the knee and ankle of the left side being quite stiff from the long confinement.

After he had been about the ward for a week or ten days he drew my attention to the right leg, and I found that the tumour in the popliteal space, which had not been the source of any discomfort, and hitherto had not altered since his entrance into the hospital, had now increased to the size of a hen's egg, was pulsating, and gave the characteristic bruit. On the 4th of March I ordered Briddon's compressor to be applied, but the instrument did not work well, the pads slipping from their place. The next day I flexed the leg upon the thigh to the full extent, but this could not be borne, and on the 6th, after bandaging from the foot up, I flexed the leg so as partially to cut off the supply of blood. This was done for two hours at a time, two or three times in the course of the day. He said he could bear that degree of pressure any length of time. The pulsation had diminished considerably by the next day, and the treatment was therefore ordered to be continued persistently for forty-eight hours. At the expiration of half that time all pulsation in the tumour had disappeared, and it did not recur. The limb was, however, retained in the same position for the appointed time in order to guard against recurrence. The tumour diminished in size, and by the 20th of March the measurement in circumference was ⅜ of an inch less. It continued rapidly to improve.

The long confinement in bed had produced, as I have said, great rigidity of the knee and ankle of the left leg. The knee yielded readily to the various methods employed to render it limber, but the ankle resisted the most persistent efforts with shower-baths, warm applications, etc. etc. The heel was drawn up, forming a pronounced talipes equinus, the foot being completely extended. On the 27th of March I cut the tendo-Achillis, and four days after placed the limb in a plaster-of-Paris splint. He

did well, and on the 3d of May was discharged cured. He has resumed his former occupation, suffering no inconvenience whatever. The tumour in the right side has nearly disappeared.

PROVIDENCE, Aug. 13, 1875.

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ART. XVIII.—1. *Labour without apparent Liquor Amnii; Delivery by the Forceps.* 2. *Pernicious Jaundice; Umbilical Phlebitis and Peritonitis; Post-mortem Appearances.* By F. A. BURRALL, M.D., of New York.

CASE I. A married American lady, about twenty-eight years of age and a primipara, fell in labour on the 1st of last November, the vertex presenting in the left occipito-anterior position. The uterine contractions became marked at nine o'clock in the evening, and I was sent for during the night. After having satisfied myself concerning the presentation of the vertex and apparent integrity of the membranes, I awaited the discharge of the amniotic fluid with the interest which usually attaches to that occurrence. The contractions were good, and, for a time, the progress was satisfactory. In the morning I left my patient for awhile, expecting to find the labour considerably advanced on my return. In this I was disappointed, for notwithstanding some progress seemed to have been made in my absence, there had been apparently no rupture of the membranes, although the contractions had been active. A cloth applied to the genitals by the nurse, when the patient had risen and sat upon the closed-stool, remained quite dry. At about two o'clock the head was in the lower part of the excavation, but for some time had made no progress, and the patient was becoming anxious and discouraged. Examinations revealed a fluctuating tumour, which conveyed to the touch the sensation of the amnion filled with its fluid, and it seemed very clear that there had been no rupture. The pelvis was ample, and I endeavoured without success to break the membranes with my nail. I was deterred from using any sharp instrument for this purpose, as it seemed to involve some risk, and I thought I felt something like *the fine hairs of an infant* upon the presenting part, which was, however, very resilient, and resembled closely the bag of waters. The vagina was not dry, but the condition of the patient made me anxious that the labour should not be unduly prolonged, and I, therefore, at about two o'clock P. M., with the assistance of Dr. W. H. Kemp, applied the forceps, and delivered my patient of a healthy female child, which weighed about eight pounds. The head was small and hairy, and the delivery quite easily accomplished without laceration of the perineum; no membranes were visible during the operation. A moderate gush of blood followed the extraction of the child. The placenta and membranes followed in about a quarter of an hour after the birth of the child. There was nothing very marked in connection with convalescence.

This case is interesting from the fact that the quantity of liquor amnii present was exceedingly small, and a very elastic caput succedaneum gave the sensation of the bag of waters. It seemed to me as if an unusually

tough amnion were interfering with the progress of the labour, as I did not see any other satisfactory cause, and had it not been for the hairs which I thought I perceived upon the presenting part I might have made more decided efforts to rupture the supposed membranes.

I was afterwards informed that a near connection of my patient had passed through a similar labour in which there were "no waters," and one or two physicians to whom I have mentioned this case have met with an analogous experience in their practice; others have regarded it as novel and interesting.

Authorities speak of the quantity of amniotic fluid at term as very variable, but in no work which I have seen has there been a particular mention of the circumstance, that the amount of waters may be so small as to leave the physician doubtful whether they have escaped.

Under ordinary circumstances this would not be of much importance, but in delayed labour where a resort to instruments might be contemplated it would be a matter of decided interest to learn whether rupture of the membranes had or had not occurred. At such a time the perception of the fine hairs upon the scalp of the child would be a diagnostic mark between the bag of waters and the caput succedaneum.

CASE II. On the 4th of February, 1875, I was requested to see a female nursling, aged sixteen days, who was in the maternity department of the New York Infant Asylum. The mother was apparently healthy, although she had been suffering from albuminuria, and notwithstanding she had lost four children, I could not discover that their mortality was due to hereditary predisposition. I found the child with diarrhœa, jaundiced, and drooping. Very small doses of mercury were given, to which minute doses of quinia were subsequently added. Wine whey was also administered.

*Feb.* 7. There is no improvement; tongue dry; gums disposed to bleed. The ulcer left by the separation of the umbilical cord has never healed. Abdomen swollen, with flatness on percussion over its right inferior portion.

The child died at mid-day of Feb. 7th, and the subsequent *post-mortem* examination was made by Dr. B. F. Dawson, who has furnished me with the following notes:—

*Autopsy.*—Rigor mortis well-marked; skin and conjunctiva showing intense icteric discoloration; abdomen somewhat distended, and resonant throughout. The seat of the umbilicus occupied by an ulcerated circular depression about half an inch in diameter, surrounded by a greenish-brown discoloration of the skin, varying in intensity of colour, to the extent of half an inch. The ulceration covered with a grumous, very offensive secretion. From the ulcer there was a darker marking of the skin over the course of the umbilical vessels, which on being lightly pressed upon was found to be pathologically softened, and caused a freer discharge of a very offensive purulent ichor. On opening into the peritoneal cavity signs of general acute peritonitis were evinced by a soft inflammatory exudation, covering the viscera, and completely filling the pelvic cavity, in which space the intestines and bladder were matted together by the purulent exudation, which was of the consistency and colour of soft butter.

There were also about four ounces of fluid in the pelvic cavity. On examining the peritoneal surface of the abdominal parietes beneath the umbilicus it was seen to be of a gangrenous discoloration, softened, and the vessels of the surrounding tissue intensely injected. This condition extended along the course of the umbilical vein, which was very greatly distended and apparently filled with fluid. Icteric discoloration of the viscera was slight, excepting the liver, which was intensely discoloured. The liver, umbilical vessels, and that portion of the abdominal parietes occupied by the ulcerated umbilicus, were removed. Examination showed the gall-bladder to be distended with a colourless fluid, evidently mucus secreted by the bladder. On passing a probe from the ulcerated surface of the umbilicus in the direction of the umbilical vein, it was found to pass readily throughout the extent of the latter. On opening the vein its walls were found thickened and softened, and its contents composed of a purulent fluid, which was shown to be pus by the microscope. A careful examination of the tissue of the liver failed to show any purulent deposits. The contents of the gall-bladder were accidentally lost, consequently an examination was not made.

On opening into the pleural cavities the right was found to be the seat of a pleuritis, with apparently purulent exudation.

No other organs were examined.

A yellow discoloration of the skin is, as is well known, a frequent accompaniment of very early infancy. It is of few days' duration, and as it disappears the skin resumes its normal hue. Steiner says that "about two-thirds of all children give more or less distinct indications of jaundice within the first week of life, about 6.6 per cent. more of the cases occurring in males than in females, and the affection being on the whole more marked among the former. . . . It is noteworthy that the discoloration is very frequent over the region of the pelvis, and that the early passage of the meconium or its retention does not seem to influence its production."[1]

He also says "it may be due to some blood alteration, and in this case is almost always pyæmic, having its origin in umbilical phlebitis." There is little if any question that the present instance was one of the characters referred to by Steiner, known as pernicious jaundice.

Since the occurrence of this case, the custom has been established in the Asylum of dressing the cord with a solution of carbolic acid in glycerine, for the purpose of averting septic absorption.

With regard to the treatment of developed pernicious icterus, Vogel regards it as eminently unsatisfactory, for he writes, "so far as I am aware, there is not one case of recovery to be found in the whole medical literature."[2] In the present instance none of the agents which were administered to meet the apparent necessities of the case seemed of any particular avail.

[1] Diseases of Children, p. 264. [2] Diseases of Children, p. 72.

ART. XIX.—*A new Optometer for Measuring the Anomalies of Refraction and the Field of Vision.* By S. D. RISLEY, M.D., Chief of the Dispensary for Eye Diseases at the Hospital of the University of Pennsylvania. (With four wood-cuts.)

THE anomalies of refraction and the disturbances of accommodation and convergence depending upon them furnish a very important chapter to the ophthalmologist. A very large proportion of the annoyances or positive and severe suffering, from which patients seek relief, grow directly from certain anatomical departures from the normal eyeball, which disturb the proper relation between the refracting apparatus and the perceptive layer of the retina. These conditions may be present in very slight degrees, causing but little if any annoyance, or so great may be the defect as to render comfortable or accurate vision impossible.

The selection of glasses which shall correct these optical defects becomes then a matter of the first importance, and demands at the hands of the oculist a careful determination of the existing refractive condition of the eye. To accomplish this end, much time and patience are required, even with the aid of the best appliances. In the more frequently occurring defects, as *myopia* and *hypermetropia*, the problem is comparatively a simple one. Then, too, in these an approximate correction will often prove all that is necessary; but when these conditions are associated with astigmatism, or when the latter alone is present, the problem becomes more difficult of solution. In astigmatism nothing less than a full correction promises, with any certainty, relief from its annoying or painful consequences. Numerous methods have been devised to give increased facility, and to insure accuracy in determining the degree of this anomaly, and have been employed wholly or in part by ophthalmologists in their daily routine of practice. Necessarily these have been only variations and more or less convenient applications of certain well-known principles. The method most used in this country, is the one devised by Dr. Green, of St. Louis, Mo. (vide *American Journal of the Medical Sciences*, Jan. 1867). It would seem, indeed, that, as a series of test objects for indicating the influence exerted by the astigmatic eye over parallel rays of light, nothing further is to be desired.

In order to facilitate the ready and accurate application of the various methods in use, I have devised the optometer, described in the following pages, and after a year of constant use of it, I recommend it without hesitation to others labouring in the same field. No new principle is involved in the apparatus, but, in its present form and convenient adaptation of various methods and test objects, I believe it to be unique. As seen in Fig. 1, it consists of a stand A, twelve inches high, which clamps by a capstan

screw firmly to the table.[1] To this is attached a movable chin rest B, a pair of graduated semicircles C, with their concavity upward for the reception of trial glasses, stenopaic slit, etc., a graduated triangular bar M, 20″ long, supporting a carrier L, which moves freely throughout its length, and a perimeter H, which may be adjusted and removed at pleasure.

Fig. 1.

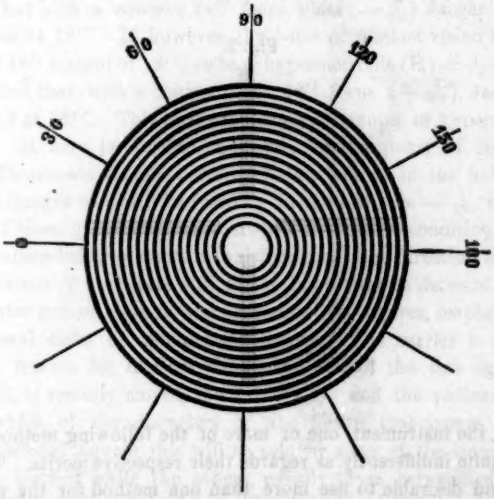
A. Stand. B. Chin rest. C. Holders for test glasses, etc. M. Carrier bar. L. Carrier. H. Perimeter. I. Fixation point. D. Slide. K. Perimeter head and graduated scale. G G. Semicircles showing three grooves for glasses, etc. 1 and 2. Milled head screws.

The stand is a hollow cylinder admitting a brass rod which moves up and down within it freely, thus extending the height of the stand to eighteen inches. It can be fixed at any point by the screw (1). To this rod is firmly secured a brass quadrant, to the upper anterior part of which is attached the bar M. The quadrant moves on a pivot throughout its extent, so that it gives to the bar M a downward movement through 45°. It may be arrested at any desired point by the milled-head screw (2). To the posterior part of the quadrant is attached the holders C. These are

[1] When desired a stand in place of the clamp is furnished.

so constructed as to permit the most varied adjustment in order to centre the glasses before the eyes, or they may be removed entirely, which is required when the perimeter, hereafter described, is in use. In the concavity of the semicircles there are three grooves for the reception of glasses, etc., and both their anterior and posterior surfaces are graduated in degrees corresponding to the Nachet test frames. One or more glasses may be placed in the semicircles at the same time, and the distance at which they are centred read off on the holders, at C.[1] The cylindrical lenses can be readily rotated, and the direction of the axis read off on the frame. The bar M is graduated in fractions of an inch commencing with the posterior surface of the holders. The carrier moving upon it is designed to bear a series of cards containing the test-types of Snellen and of Jaeger, and numerous other test figures. Also an opaque carrier plate with a circular

Fig. 2.




opening in its centre two and a half inches in diameter, the lower half of which is graduated in degrees to correspond to that upon the semicircles. Behind the circular opening fits a piece of ground glass, which, when turned toward the light gives an illuminated background. The plate is designed to receive and permit the free rotation of a number of thin brass disks with test figures cut in them.

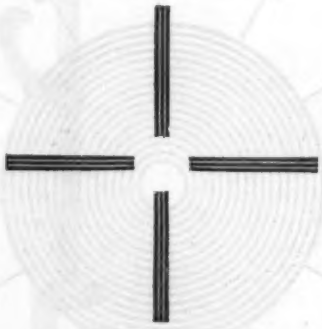
The tests for astigmatism recommended for use in this instrument include the valuable series of Dr. Green[2] (the printed figures and those in-

[1] In constructing these holders I am indebted for valuable suggestions to Mr. Samuel L. Fox, of the firm of Queen & Co., Opticians, Philadelphia.

[2] Trans. American Ophthalmological Society, 1869.

tended for back illumination are reduced for use at 12″ instead of 20′, as originally designed); the concentric circles of Otto Becker, also reduced for 12″ (Fig. 2); a cross of wires, perhaps the most valuable of the entire series, consisting of a rim of brass, with milled edge to facilitate its rotation in the carrier plate, with two groups of five wires each, stretched 1 mm. apart, crossing the centre at right angles. Another valuable test is furnished by a metal disk with lines cut through it, as shown in Fig. 3, for back illumination. Where there is much diminution of acuity of vision I have found this disk a valuable aid. A metal disk, with central perforation, intended to furnish a bright point of light, will also be found useful. These disks are each $2\frac{3}{4}$″ in diameter, and their distance from the eye is read off on the graduated bar. To the holders are adapted a stenopaic slit and a modification of Thomson's disk, utilizing the experiment of Schreiner. (Vide *Am. Journ. Med. Sci.*, January and October, 1870.) Each has a milled edge to facilitate its rotation in the holders.

Fig. 3.



In using the instrument, one or more of the following methods may be employed quite indifferently as regards their respective merits. Usually it will be found desirable to use more than one method for the purpose of verifying first conclusions. The determinations are all made at an artificial far point—10″ or 12″—and with the eye thoroughly atropinized, when a careful and accurate measurement of the refraction is desired. Without this, except in aged people, there can be no assurance that the result obtained is a correct one, whether the determination be made at 12″ or 20′. Without the use of atropia I prefer to rely upon determinations made with the ophthalmoscope in a moderately darkened room, than upon the most careful trial with glasses. At first I felt some hesitation in relying upon corrections made at 12″, but after I had in numerous cases verified them by repeated, independent determinations at

20′, I gained confidence in this method, and now without hesitation prescribe the correcting glass so determined.

Before using the atropia, the range of accommodation is determined either with the wire cross, point of light, or by the test-letters, and the farthest and nearest point recorded. After paralysis of the accommodation by atropia $+\frac{1}{12}$ is placed in the holders before the eye, and the card containing No. 1 or No. 2 of Jaeger's test-types placed in the carrier, and the distance at which it is read (if it can be read at all) noted. If they cannot be read at any distance (very high degrees of myopia or hypermetropia excluded), one or more of the astigmatic test-cards is dropped before the eye in the carrier to ascertain if the inability to read depends upon the presence of astigmatism. The letters are read, however, but not at 12″, the focal distance of the glass in the holders. If Jaeger No. 1 can be read first, or the wires of the optometer are first distinctly seen, *e. g.*, at 8″, we have myopia (M) $= \frac{1}{8} - \frac{1}{12} = \frac{1}{24}$, and it is found that with a concave 24″ focus glass ($-\frac{1}{24}$) Jaeger No. 1 can now be read at 12″. If, however, the point of distinct vision is found to be, *e. g.*, at 16″ instead of 12″, we have hypermetropia (H) $= \frac{1}{12} - \frac{1}{16} = \frac{1}{48}$. We now find that with a convex glass 48″ focus ($+\frac{1}{48}$) Jaeger No. 1 can be read at 12″. This in simple cases of myopia or hypermetropia is sufficient. It may be verified, however, by the point of light viewed through Thomson's double perforated disk placed in the holders, when the double images seen will be fused by, in the one case $-\frac{1}{24}$, in the other by $+\frac{1}{48}$, if these glasses represent truly the refractive condition of the eye.

Astigmatism being present, its existence and the direction of the principal meridians of curvature will at the same time be detected by placing in the carrier one or more of the numerous test figures, employing either the cut metal disks or the printed figures. The carrier is placed at a point too remote for distinct vision, and one of the test figures being placed in it, is steadily moved toward the eye and the patient desired to indicate which of the diameters of the figure first comes into view. With the printed figures this will be told by some of the lines appearing black and distinct while the others, usually those perpendicular to the first, are still hazy and indistinct. The first line will be perpendicular to the meridian of most favourable corneal curvature. If the concentric circles be used (Fig. 2), the dark or distinct line through the figure will be parallel to the meridian of most favourable curvature. If the cut disks are used, the meridians are selected by the distinctness with which the radiating lines are seen, and the degree read off on the scale below them, attached to the carrier-plate. In the disks containing the radiating lines of perforations or the cross, none of the minute holes are seen as round points of light, but with indistinct outline, which for each individual hole is more or less irregularly oval, the long axis of each pointing in the same general direction. It follows that in some one of the radi-

ating lines, or if it is preferred to rotate the arms of the cross of holes before the eye, it will be found in the direction of some meridian that these oval points of light are ranged side by side, while at the meridian perpendicular to this they are arranged end to end, and if the anomaly be considerable may even be run together so that the holes blend with each other and form a continuous line of light which will be perpendicular to the meridian of most favourable curvature. Having in this manner discovered the principal meridians, it now remains to determine the refraction in each. This may be done in a great variety of ways with the test objects, etc., furnished with the optometer. The following will be found quite sufficient. The wire cross is placed in the carrier beyond the limit of distinct vision, with its groups of wire parallel with the principal meridians. (The meridians may often be best picked out by revolving the cross before the eye.) It is now moved slowly toward the eye. The group of wires which stand perpendicular to the meridian of most favourable curvature will come first into view. The distance at which they are most distinctly seen is now noted, and the distance for the second group sought and noted. The difference between these distances and 12″—the distance at which an emmetropic eye would see them best—gives the defect for each meridian, and their difference the amount of astigmatism; *e. g.*, with $+\frac{1}{12}$ before the eye—principal meridians proved to be vertical and horizontal, vertical wires of the cross seen at 16″, horizontal wires at 12″. By this there is shown to be in the horizontal meridian of the cornea $H=\frac{1}{12}-\frac{1}{16}=\frac{1}{48}$; vertical meridian emmetropic; hence simple hypermetropic astigmatism. In high degrees of hypermetropia it is sometimes desirable to use a stronger glass than $+\frac{1}{12}$, *e. g.*, $+\frac{1}{8}$ or $+\frac{1}{6}$; so that the far point shall not be further than 20″ from the eye—the length of the carrier bar. The same may be done with either of the test figures, but the wires usually are most satisfactory.

The results thus obtained may also be found by one or more of the following expedients:—

Place in the holders the stenopaic slit parallel to one of the meridians, and Jaeger No. 1 at the artificial far point—12″. The glass with which the type can be most easily read is the measure of the refraction for that meridian, and in the same manner the second meridian may be determined; the difference between the two giving the degree of astigmatism. It may be still further verified by means of Thomson's double perforated disk and point of light. The glass which fuses the double images is the measure of the anomaly for any given meridian; indeed this may be used first, and it will be found rarely necessary to depart from results thus obtained. A single case selected from practice will serve to illustrate the foregoing.

L. E., æt. 18, *mixed astigmatism in right eye, myopic astigmatism in left*, $V=\frac{20}{cc}$ each eye. o. s., $+\frac{1}{12}$ before the eye. Vertical lines were seen

at 8″, horizontal at 6″, showing in the horizontal meridian $M = \frac{1}{8} - \frac{1}{12} = \frac{1}{24}$, in the vertical meridian $M = \frac{1}{6} - \frac{1}{12} = \frac{1}{12}$, or $M = \frac{1}{12} - \frac{1}{24}$, and $Am = \frac{1}{24}$. It was then found, that, with stenopaic slit placed before the eye vertically, and test-types at 12″, the weakest glass with which Jaeger No. 2 could be read was $-\frac{1}{12}$; with slit horizontal $-\frac{1}{24}$ was sufficient. The second method thus verified the results of the first. $-\frac{1}{24}$ ⊂ $-\frac{1}{24}$ cyl. axis horizontal was now placed before the eye, with which Jaeger No. 1 was read without difficulty at 12″.

O. D. answers with astigmatic figures confusing. Cross placed at 16″, wires best seen vertically. Not so distinctly when rotated to right or left. Not so clear nearer or further than 16″. Horizontal wires seen only at 5½″. Thus was shown in the vertical meridian $M = \frac{1}{5.5} - \frac{1}{12} = \frac{1}{10}$, in the horizontal meridian $H = \frac{1}{12} - \frac{1}{18} = \frac{1}{48}$, or Amh, corrected by $-\frac{1}{10}$ cyl. ax. horizontal ⊂ $+\frac{1}{48}$ cyl. axis vertical ($-\frac{1}{10}$ cyl. | $-+\frac{1}{48}$ cyl.). This result was then verified by the stenopaic slit and trial glasses, and by the point of light.

This point of light, doubled by Thomson's disk, is used at 12″, the double image being fused by the correcting glass, or the point of light may be moved with the carrier back and forth until but one image is seen, which will be at the distance for which the eye is focussed. The difference between this and 12″ is the anomaly of refraction.

The ability to read No. 1 of Jaeger's types with $+\frac{1}{12}$ at 12″, does not necessarily prove that $V = \frac{20}{xx}$. Many persons with sharpness of vision no greater than $\frac{1}{4}$ are able, even without the increase in size of the image afforded by $+\frac{1}{12}$, to read Jaeger No. 1 at 16″, or in strong light at 18″, or even 20″. Again, even with an imperfect image formed upon the retina, great familiarity with the form of the letters will often make it possible to read Jaeger No. 1, or to name the letters of No. xx of Snellen's types at 20′. So that in relying upon letters or reading alone as a test for the correction of the defects of refraction, there is great liability of being satisfied with only an approximate correction. A far more rigid test is the point of light or the wire cross. When the point of light loses the star-like radiations, and is seen as a round clear-cut hole, or when the individual wires in the cross are sharply seen, with no tendency to doubling or blurring of their edges, the anomaly is, without doubt, corrected.

As a test for acuteness of vision, the "*internationale sehproben*" of M. Burckhardt are more reliable than letters. I have found that to count the dots in his series at the required distance is much more difficult than to read the Latin text subtending the same angle.

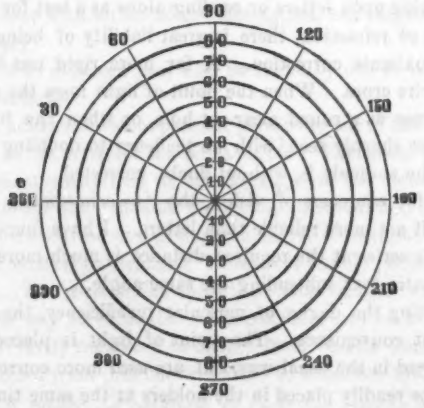
In determining the degree of muscular insufficiency, the optometer has proved a great convenience. The point of light is placed at 12″, and prisms employed in the usual way, but are used more conveniently, as one or more can be readily placed in the holders at the same time. The point of light is better than the dot and line, or than any ordinary object held in the hand, and avoids the annoyances which attend the use of a wax

candle, or other source of light. Insufficiency for distance is determined by directing the gaze to a point of light in the window, furnished by placing over the window-pane a piece of binder's board with a perforation $\frac{1}{4}''$ in diameter in its centre, with white tissue-paper over it.

Inability to converge for an artificial far point has hardly presented itself as an objection, for the reason that the determination has invariably been made for each eye separately; a tendency to diplopia only appearing, when the patient was requested to read at 10″ or 12″ with the correcting glass over both eyes, which was readily remedied, except when marked insufficiency of the internal recti muscles had before existed, by slightly decentering the glasses, which was readily accomplished with the adjustable holders.

A very valuable feature of the instrument is the perimeter H, Fig. 1. It may be adjusted, as seen in the figure, upon the bar M at pleasure, and when not in use removed. When the perimeter is in use, the carrier and holders are to be removed. It consists of a quadrant of a circle, the radius of which is 12″. It is shown at H in Fig. 1. When adjusted, it is placed on the bar M at 12″. The mechanism for adjustment allows the rotation of the quadrant around the bar as a fixed point. In its rotation it moves over a graduated circle at K, in its course describing a hemisphere, the pole of which would be the fixed point upon the axis of rotation. The meridian of the sphere at which the quadrant may be placed is read off on the scale at K. The quadrant is also graduated from the bar out to 90°, and has upon it a slide, D, designed to carry different coloured buttons.

Fig. 4.




The hemisphere and circles described by the perimeter are represented in Fig. 4. The concentric circles serve to show the imaginary lines drawn

by the graduations on the quadrant in their course around the bar, represented by the centre of the figure, while the radiating lines are the points at which it has been arrested in its course. Fig. 4 is the blank I use for recording the field of vision. These blanks are furnished with the instrument, either with gummed backs that they may be conveniently pasted in the note-book as desired, or in books of one hundred each with blank numbers for reference to the case-book.[1] The patient is seated before the instrument with the chin-rest so adjusted as to bring the eye to be examined an inch above the bar M, the inferior orbital ridge resting against the support for the holders which have been removed. The point of fixation for the macula lutea is now so arranged that the image of the perimeter head shall fall upon the blind optic nerve entrance. The field of vision in any of the meridians is now ascertained, if desired, for white or red, yellow, green, and blue, by placing these different coloured buttons in the slide and moving it out to the limit of the field; the point at which it is last seen being recorded in a corresponding point on the blank, 0° being to the left, which becomes for the left eye the temple field, but nasal field for the right eye. To discriminate it is only necessary to mark them right and left. The same blank may be used at succeeding consultations, by recording the field with different coloured ink or crayon, and the date at which it was taken in the same colour, in the margin. A map of the field is made by simply drawing an ink line through the limiting mark on the different meridians.

The field of vision can thus be accurately mapped out, and recorded in such a manner as to be rapidly and conveniently studied and compared with former or subsequent records. This apparatus presents the advantages of giving an accurate field with a satisfactory method of recording it, while it is not so cumbersome and unsightly as many of the instruments recommended for this purpose, and when not in use is easily removed and placed out of the way in its case, or it may be left adjusted without serious inconvenience when using the optometer for other purposes.

112 SOUTH SEVENTEENTH STREET, PHILADELPHIA.

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ART. XX.—*Enormous Abscess of Kidney cured by Incision and Drainage.* By J. F. HEUSTIS, M.D., of Mobile, Ala.

THE following case is worthy of record on account of its recovery from a condition apparently hopeless; and the immediate and complete relief from great suffering afforded by the operation for evacuation of the pus.

[1] The complete instrument is furnished by Queen & Co., 924 Chestnut Street, Philadelphia.

The young man had been under medical treatment for some time before he came into my hands; though I had seen him in consultation, and concurred in the course of treatment pursued. At the time of my first seeing him he was anæmic and emaciated, and bore the appearance of constant suffering; and scarcely able to stand upright on account of the pain in his back. He was then passing large quantities of pus in his urine; and there was some fulness in the region of the left kidney. As the pus found a free escape by the ureter, bladder, and urethra, although rather a round-about one, it was considered sufficient to pursue medical treatment alone. About the middle of May, I was called upon to treat him. His condition had become rather worse, owing to the increased difficulty of getting rid of the pus, which would sometimes block up the urethra, and would escape with a spluttering noise, on account of the presence of gas from putrefaction. It soon became apparent to my mind that the mode of evacuation of the abscess was too devious and difficult. And as it was attended with suffering of the bladder, superadded to the actual disease of the kidney, the case was rapidly becoming hopeless. While debating whether it would not be better to make an opening in the loin, and give free vent to the offensive pus, it stopped flowing. With the cessation of the appearance of the pus in the urine, the pain in the back or loin increased; and the fulness or tumefaction increased also, so as to be more apparent. The patient had now become so reduced as to be unable to leave his bed, and hectic fever set in. There was no doubt about the cause of the increased gravity of the case. The ureter, which had been affording an outlet for the pus, had become closed, and the pus was accumulating at the site of its formation. This determined the doubt. An opening must be made to give a free, direct, and constant escape to the accumulated pus, or death was inevitable. I had had him under treatment at that time nearly a month, and it was the middle of June when this state of affairs was reached. Upon inspection there was an evident bulging of the left hypochondriac and lumbar region. The needle of a hypodermic syringe was run through the abdominal wall just below the last rib and outside of the erector spinæ mass where the bulging was most conspicous. Immediately there began to flow through the tube of the needle a thin and horribly offensive pus. The needle was withdrawn, and a sharp-pointed knife thrust nearly through the thickness of the wall; and a director with slight pressure passed into the cavity of the abscess. The knife was run along the groove of the director and the opening enlarged sufficiently to allow the finger to be thrust in. A great quantity of thin fetid pus poured out, but as it was not caught in a vessel, exact quantity cannot be stated, though, from the length of time it was flowing, and the size of the stream, I thought it would amount to three pints. After it ceased to flow, an India-rubber drainage tube was inserted well into the cavity of the abscess, and made fast by threads tied around it, which were fixed with plaster to the skin. Through this tube carbolized warm water (one drachm of carbolic acid to the pint of water) was injected until all pus was washed out, and it came away clear. Through the tube, which remained in, there was a constant flow of thin, foul-smelling pus in large quantity for some time, but diminishing and becoming less offensive gradually. To prevent systemic poisoning, favour evacuation, and set up a more healthy action in the diseased kidney, the carbolized water was thrown in with a Davidson's syringe (the nozzle of which filled the tube snugly) several times every day until the outflow was clear, and free of all purulent contamination. On two

occasions, while the cavity was being washed out, a mass of sloughy substance of gelatinous consistence about as large as a finger protruded at the opening, and was drawn out. This occurred a short time after the operation, perhaps not more than a week or ten days. And up to this time, except that there was some improvement of appetite, there was very little to encourage a hope of recovery, the weakness and emaciation were so extreme. From this time the improvement was steady and remarkable. His appetite was fully restored, and there was a steady increase of flesh and strength. As his anæmia called for iron, he was given the muriated tincture, with a little honey and water to prevent constipation. It acted very well, and soon the hue of health began to tinge the cheeks. The pus became laudable, free from smell, and smaller and smaller in quantity. The incision healed until the tube was tightly inclosed, and water ceased to regurgitate by its side. The size of the cavity of the abscess, as shown by the quantity of fluid it would retain before the outflow began, was so reduced it would scarcely hold an ounce. The tube being in the way, and causing some pain, it was removed about six weeks after its first insertion. The injections were still kept up once a day, partly to insure the cleaning out of the cavity of the abscess, and partly to prevent the entire closure of the opening. But the opening continuing to contract until the small pipe of the syringe could scarcely enter, a smaller drainage tube was inserted and tied in, for fear of a complete closure and a possible return of trouble. On the 7th of August he came to my office, and it was then the small tube was inserted. He stated that within the last four days, a small quantity of pus, less than a teaspoonful, had occasionally shown itself in the urine; but he had not seen any for a day or two—that his urine was perfectly clear, and was passed freely and easily. After passing the last drainage tube to the depth of two inches, there was no appearance of pus after waiting several minutes. But he said there had continued to be some escape of a thick odourless matter, which necessitated his wearing a piece of cloth to protect his clothing. He has now (Aug. 19th, 1875) the appearance of good health, and has gained flesh to such an extent that his face has become full. He goes about without fatigue, and says he has no pain anywhere.

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ART. XXI.—*Amputation of Clavicle and Scapula.* By THEO. J. YOUNG, M.D., of Titusville, Pa.

MAY 31, 1875, I was summoned to attend a child said to have been run over by a train of cars. Arriving at the house, probably within twenty minutes of the time of the occurrence, I found a little girl not yet two years old with the right arm severed from the body, and the tissues of the whole shoulder and breast fearfully mangled. Amidst all the noise and aimless crowding of a crazed multitude and the moanings of a sorrow-stricken family, the little victim of this sad accident alone appeared to be free from terror and suffering. Though its face was pale, and the pulse

scarcely perceptible, its large black eyes had not lost their wonted lustre, and with the expression of strange wonderment and stoic indifference to pain she watched my movements in discovering the nature and extent of the injury.

After a short preliminary investigation, I hastened to get my instruments and the assistance of my friend Dr. T. F. Oakes. Having at my first visit administered a stimulant we found the pulse somewhat improved and determined to proceed at once. Almost without a struggle the child yielded to the anæsthetic, and the following was found to be the extent of the injury. The right arm was severed from the body about three inches below the axilla. All the muscles, nerves, bloodvessels, skin, and connective tissues of the shoulder were torn to shreds and lay with the infiltrated coagulated blood in a confused mass. There was now not a trace of hemorrhage, the clavicle was fractured at the outer third and exposed to view close up to the sternum. The scapula was fractured in two places, one fracture extending transversely across the blade from the middle third of the posterior (internal) border, to about the middle of the anterior (external) border, and another extending from the superior scapular notch to the groove at the anterior border. The operation demanded, thus necessarily embraced the following parts, viz.: The lacerated soft parts, the glenoid cavity, and the neck as far back as the upper third of the anterior border; the acromion and coracoid processes, together with the outer third of the clavicle. The fracture in the middle third of the scapula was not disturbed. The subclavian artery was tied, and during the whole operation the loss of blood did not exceed *two ounces*.

Although the consequent prostration was at times alarming, and dissolution seemed inevitable, yet the patient promptly responded to stimulants and gradually rallied. Twelve hours after the operation the child fell into spasms, which I attributed to the constant throng of curiosity hunters admitted to the room in violation of my orders. These spasms recurred at short intervals for twenty-four hours, when they finally yielded to treatment. From the nature of the wound a cure by suppuration and granulation could only be looked for. On the sixth day all sloughing had ceased, and the parts presented a healthy granulated surface with a wonderfully rapid and successful effort to fill up the deep gap. After a two weeks' battle, with occasionally symptoms of pneumonia, attacks of diarrhœa, want of appetite, and noticeably increasing emaciation, the little heroine at last triumphed, and to-day, five weeks after the accident, on the "fourth day of July," she celebrates her second birthday, and the recovery from an accident which justified but small, if any, hope of recovery.

# REVIEWS.

ART. XXII.—*Ventilation of Hospitals.*

1. *Report of the Pennsylvania Hospital for the Insane.* 1874. By THOS. S. KIRKBRIDE, M.D.
2. *On Hospitals.* By GEORGE DERBY, M.D. (Fifth Annual Report of the State Board of Health of Massachusetts.)

THIS report, like all Dr. Kirkbride's, is interesting both to the friends of humanity and the friends of science. He takes this occasion to speak at some length on the subject of warming and ventilating hospitals. Presenting, as he does, the fruit of thirty years' observation and study, his conclusions are entitled to the highest respect and confidence. He reaffirms the conviction published twenty years ago in a treatise on the construction, etc., of hospitals for the insane, that an effectual ventilation of such establishments can be obtained only by means of some artificial motive power. The favour recently shown in some quarters to very different views, and set forth in the strongest manner by Dr. Derby, has led to this fresh declaration of his own, as warranted by the extreme importance of the subject; and for the same reason we have thought it worth our while to call the reader's attention very briefly to some of its most prominent aspects.

We doubt if any matter of sanitary science has been more ventilated than ventilation itself. In the transactions of every board of health, in the reports of every hospital for the insane, as well as those for bodily disease, in plans for new buildings more or less public, we can scarcely ever fail to find something respecting the importance of ventilation, and within the last twenty-five or thirty years, it has been made the theme of scores of special treatises. And yet, after all the speculation and experiment during that period, there remains a wide diversity of opinion as to the comparative value of the various methods proposed, while some are seriously asking if ventilation really does ventilate. At first blush this may seem strange, as the needs of air in respiration have been duly described by physiologists; its movements under various circumstances obey the laws of pneumatics; the volume and rapidity of its currents are easily calculated, and the happiest results have been often obtained in actual practice. Indeed, the very simplicity of the subject may have led to some of this diversity of views, because, as we well know, the easier, apparently, a matter is to understand, the more ready are those to pass in judgment upon it who lack the requisite knowledge. It is not strange, therefore, that to the uninstructed, anxiously desiring to learn the truth, the whole subject seems, to use a homely term, to be in a hopeless muddle. It may be worth our while, therefore, to review the situation—to show very briefly what progress has been made, and to see, as well as we can, where we now stand.

It is within the memory of the present generation that any special attention began to be given to the ventilation of hospitals. Up to that

time, if it was supposed that they needed a more frequent change of air than was furnished to ordinary dwellings through the doors and windows, it was trusted to Providence, aided occasionally by a resort to chimney-tops, cowls, and turncaps. Some thirty-five or forty years ago, the idea occurred to a few thinking people that in order to maintain the sanitary condition of these establishments at the highest point, and thus enable them to fulfil their purpose in the best possible manner, they must be furnished with a more frequent change of air than was needed in a domestic residence. Unfortunately, this period happened to coincide with that when new methods of warming came into favour, no part of *their* purpose being to improve the ventilation. On the contrary, they had the opposite effect. The chimneys with their open fires, which had been the chief reliance, and which did really promote some change of air, were supposed to be no longer required in buildings warmed exclusively by direct radiation from pipes conveying steam or hot water. The effect on public opinion was manifested in a rule adopted by the governors of the Lincoln Asylum for the Insane, England, absolutely forbidding any attempt to warm the wards in any other way than by fires in the chimneys. But the new idea survived the perils encountered in its germination, and in various ways continued to show signs of life, until it became an active, efficient principle in the construction of hospitals, prisons, court-rooms, and other public buildings where large numbers of people congregate.

The project of furnishing hospitals a better ventilation implied the application of an artificial force that would effect a more frequent interchange of air than could be obtained by ordinary arrangements. To carry this purpose into effect required no discovery or invention, but simply the mechanical application of principles as well established as any in art or science, by means of contrivances better fitted for the purpose than any then in use. In the early part of the last century, Dr. Desaguliers, in order to ventilate the British Houses of Parliament, provided in the attic a chimney heated by a fire, into which the foul air entered through openings in the ceiling. At a later period, he introduced a centrifugal wheel or blowing fan, driven by a single labourer. In 1820 the Marquis de Chabannes substituted for the fire in the chimney a number of cylinders filled with steam from a boiler below. Sir Humphrey Davy had previously provided for the admission of fresh air through a multitude of holes in the floor. These contrivances failed to secure the desired object in the highest degree, but long custom and a lack of that delicate sensibility to noxious impressions which is one of the results of modern refinement, led to such toleration of the defect, that any attempt at improvement was seldom thought of. When, however, the new Houses of Parliament were projected, it was determined that they should be warmed and ventilated in a manner most completely to reflect the science and mechanical skill of the time. Accordingly, Dr. Reid was employed to prosecute a course of experiments on the ventilation of the old houses, which ended in a systematic and elaborate arrangement, the efficiency of which was admitted by every reasonable person. Nothing of this kind so skilful, so thorough, and so effective, had ever been done before, although it was only an extension of existing principles by larger and better methods. About this time a large prison was built at Pentonville, near London, which was ventilated by means of a tall chimney starting from the ground, heated by a perpetual fire, into which all the foul-air flues were conducted. Thenceforth the indispensable need of a forced ventilation wherever many persons are

associated together continuously for any considerable time, became a very common belief, even in this country. In 1845, the trustees of the Butler Hospital for the Insane, about to be erected in Providence, R. I., engaged Dr. Bell, then superintendent of the McLean Asylum in Somerville, Mass., to visit Europe, and learn whatever he could, worthy of imitation, in hospital construction, and especially in the matter of warming and ventilation. As the result of his inquiries, he recommended the method adopted in the Pentonville prison, using the kitchen chimney, however, rather than one built solely for this purpose.

Since then scarcely one of the many hospitals for the insane established in this country has been unprovided with a forced ventilation. In them the favourite instrument is the fan propelled by the steam-engine always used in them for one purpose or another. This forces the air over coils of steam pipe, heated in cold weather, up through flues in the walls into the various apartments. The power of the fan is sometimes supplemented by that of the waste heat of fires used for other purposes. Thus, in the department for males of the Pennsylvania Hospital for the Insane, while air is forced in by the fan in the usual way, flues connected with the water-closets convey their foul air downwards and across the lawn, under ground, into the tall chimney that is heated by the smoke made by the fires under the steam-boilers. And so strong is the force thus made, that a lighted paper thrown into the pan actually roars, as the flame is drawn downwards. In a ward recently erected on the female side of the same institution, the foul air passes up into the attic, and thence into a large brick flue heated by the smoke-stack which rises through it.

Notwithstanding this almost universal adoption of a forced ventilation by the hospitals for the insane, it is a curious fact that we find it in very few of our general hospitals. In those of Philadelphia, for instance, excellent as they are in every other respect—always excepting that connected with the almshouse, which never can be excellent until it is torn in pieces and made over again—one only, the Episcopal, is provided with what may be properly called a forced ventilation. In a pavilion of one story just erected for the Presbyterian Hospital, in West Philadelphia, the only provision for admitting fresh air, besides that of the doors and windows, is that of several openings in the walls, through which the air is brought directly from the outside, *whenever it is willing to come.* The openings in the roof through which the foul air is expected to escape, will, no doubt, admit considerably more, though that may not be very conducive to a steady ventilation. In the new hospital established by the University of Pennsylvania, the admitted air is warmed by passing over steam-coils in the basement, and the pipes conveying it pass up in the foul-air flues, and impart to them some of their heat. Several open fires in each ward, as in the Presbyterian Hospital, are supposed to supply some exhaustive force. Besides these sources of ventilating power, there is no other. We understand, however, that the present arrangement is merely experimental, to be changed for something better, if found to be unsatisfactory.

This disposition among men charged with hospital affairs to ignore the advances already made in the art of ventilation, or regard them as of little account, results, we are inclined to think, from very inadequate notions as to the amount of fresh air required for the best sanitary effect, and an imperfect acquaintance with what has been accomplished. It would seem to need no prophet to tell us that of all the buildings occupied

by men or women, none require a more active ventilation than those devoted to the care of the sick. That the exhalations from their bodies, and especially from suppurating surfaces, contaminate the air, and to that degree render it unfit for respiration, nobody doubts. Nor is it denied that such emanations may adhere to the walls and floors and thus become a source of fresh disease. That apartments crowded with persons thus vitiating the air around them, require some special and larger means for renewing the air than would answer in an ordinary dwelling, would seem to be a foregone conclusion challenging universal assent. But exactly how much fresh air should be supplied to the inmates of a hospital is a point which has been decided too often by vague impressions rather than intelligent calculation. Apartments frequented by few people will get sufficient air through the doors and windows. Under ordinary conditions, a person of average size vitiates about twenty cubic feet of air in a minute. Now, to insure him his twenty feet against all adverse conditions, provision should be made for double that amount, and this is what is done in the Pentonville prison above alluded to. Substituting for the convicts of a prison the patients of a general hospital, double this amount, or eighty feet, would not be an unreasonable supply. Consequently a ward containing thirty patients would require 2400 cubic feet of air per minute, and this it must have to secure the best results of treatment. Now, can anybody suppose that by any possible arrangement depending solely on natural atmospherical conditions, even a tithe of that amount could be furnised steadily and continuously, night and day, summer and winter? With doors and windows wide open, and a stiff breeze blowing outside, we might, certainly dispense with every other means, but for how many days in the year, or portions of a day, do such conditions exist? For weeks together the windows must be closed, and for days together the air is still. No matter how many openings may be provided for the fresh air to come in, we know it will not come at those times when the temperature of the outside and that of the inside air are nearly equal.

It is a common impression that when provision is made for heating the air before it is introduced into the wards, the heat will impart to it a motion sufficient for the requisite ventilation. Considered as a system, it would be enough to say in regard to it that for a large part of the time the air is not heated at all. This method of ventilating by means of the force contained in the fresh heated air has been tried, and if the amplest experience is worth anything, its inefficiency at all times is proved beyond question. Some years ago, when State hospitals for the insane began to be established in this country, the common arrangement was to warm the fresh air in the basement by bringing it in contact with furnaces, from which it was conducted by flues in the walls to the various apartments, and from them the foul air ascended by another set of flues to the attic, and went off through windows in the roof or gables. At least such was the builder's programme, but practically it never fully accomplished the purpose. To some extent, certainly, the air was renewed by this arrangement, for the heated air which flowed in would necessarily displace an equal amount of air already used; but the interchange thus effected was not sufficient. The supply of fresh air was too small, and the ascensive motion imparted to it by the heat was not strong enough to overcome the outside pressure which forced the foul air back through many of the flues. Even this imperfect performance was not accomplished when the admitted air required

no warming. True, the slight warming of the air effected by respiration would give it an upward motion; but the idea, if ever seriously entertained, that the amount of displacement thus produced could meet all the requirements of hospital ventilation, would only show how poorly the whole matter has been understood.

The failure of the method of ventilation here described, even when supplemented by turncaps, patent ventilators, *et id genus omne*, confirmed the impression derived from general principles and the examples abroad, that resort must be had to artificial force, and it has happened, as already stated, that it is now used, in some shape or another, in nearly all our hospitals for the insane. If such means are required in them, for a stronger reason they are required in general hospitals, where the air is so much more rapidly vitiated by active bodily disease, which is a comparatively insignificant element in the former.

And now, in the face of all this testimony, we are met by the objection that all these methods of forced ventilation have practically failed. In a paper published in the Fifth Annual Report of the Massachusetts State Board of Health, by the Secretary, the late Dr. Derby, whose decease in the maturity of his powers was a serious loss to sanitary science, he says: "All systems of supplying the needed amount of fresh air to hospitals of more than one story, have failed. The most elaborate artificial contrivances do not meet this fundamental want. From the Lariboisière at Paris, to the City Hospital at Boston, they are failures, one and all." It is to be regretted that the facts that served as the foundation of an opinion likely to have so much weight were not fully given, for thus only could its correctness be tested. We may safely say, however, that they would afford it but poor support, were they no stronger than the two which are mentioned. Two methods of ventilation are used in the Lariboisière Hospital. In some of the wards the motive power is a fan; in others it is a chimney heated by pipes filled with hot water—Duvoir's system, as it is called. A few years ago the French government appointed a commission to prepare plans for ventilating the new Palais de Justice, and to aid them in this duty they made a very elaborate investigation of the ventilation of this hospital. They reported that the two methods were about equally efficient, both furnishing from 2500 to 2700 cubic feet of air per bed per hour. The commission regards 3000 feet as the proper supply, and if still more be needed, an increase in the capacity of the means is all that is required. How a system of ventilation which supplies this amount of fresh air can be called a failure, we are unable to see. To us it seems like an eminent success; and so it seemed to the commission, for they recommended the adoption of the Duvoir system in the Palais de Justice. Some would favour a larger supply, but if all was obtained, be it much or little, which was wished or expected, then, certainly, it was no failure. In the Boston City Hospital a fan has been used, and we are told that the result has not been satisfactory. Why, exactly, we know not, but there are many conceivable, and many really existing, causes, to one or more of which it may be attributed, besides the inefficiency of the system. If in Paris a fan may be made to force into a building 2700 cubic feet of air per bed per hour, we presume that by observing the proper relations of size between the fan, the air ducts, and the building, it may be made to do the same thing in Boston. But there are some well-known facts in the history of that hospital during the first few years which will explain its defective ventilation without obliging us to blame the fan. In

the first place, from motives of economy, the fan was used only a small part of the day. Then, frequent leaks in the soil pipes had contaminated the earth of the cellar. Some of the connections of these pipes with the drains were imperfect, so that sewer-gas escaped into the cellar. The fresh-air ducts, in their passage under the building, were not air-tight, and thus received sewer-gas from leaky drains and sewers. Under such circumstances, a fan with tenfold its capacity could not have given the wards pure air. Of course there was a good deal of pyæmia and erysipelas, but of which there was a marked abatement after these defects were corrected. Even without these defects the air supply would have been insufficient for lack of a proper proportion between the fan, the air-ducts, and the steam-coils.

This opinion of Dr. Derby we are unable to reconcile with his strong approval of the ventilation of the Warren Ward, lately erected at the Massachusetts General Hospital. In the last Report of that institution, he is quoted as saying (under date of April 5, 1874), after measuring the air currents several times, and finding the air supply equal to 7000 cubic feet per bed per hour, "on the whole it is the best ventilated hospital ward I ever saw." Now, this ward is warmed in a great degree by four Franklin stoves placed in its centre, and discharging their smoke into a common stack. Into a flue constructed around this stack, and warmed by it, open the foul-air flues, a powerful motion being given to their contents by the rarefaction thus produced. Stronger testimony than this in favour of artificial ventilation can scarcely be found. Had his observations been made on some day when there were no fires in the stoves, and the windows closed, he would have found the ventilation, probably, much less satisfactory. This suspicion is confirmed by the suggestion of the superintendent, Dr. Folsom, that in the summer when fires in the ward are not needed to warm the patients, the chimneys should be heated by fires below the floor, in the basement or cellar. This arrangement he has actually made in his plans for warming and ventilating the Johns Hopkins Hospital in Baltimore.

That attempts to ventilate by means of artificial force have sometimes failed we freely admit. Considering the comparative newness of the art, it is not strange that the mechanical appliances required should have been managed occasionally without a very strict compliance with the principles of natural philosophy. We have seen a central chimney for receiving the foul air too short even for the draught required by the fires under the boilers. We have seen steam coils placed in the cupola to which the foul air arose, quite inadequate to exert much extractive force, and so poorly put together that their incessant leaking made them a nuisance. We have seen a fan whose capacity for work obviously fell far short of the duty required. All this indicates only a lack of mechanical skill, not any fault in the principle. We have yet to learn the first instance of failure where the arrangements have been correctly made; and these are not a matter of magic or mystery, but simply of that knowledge of the properties of air which any high-school pupil may be supposed to acquire, of the requirements of respiration, and of an exact calculation of the force of the moving power and of the relations between the flues of ingress and those of egress.

Another source of distrust in regard to forced ventilation is a misconception of its legitimate results. More is apt to be expected than is possible in the nature of things. By no device of learning or of mechanical

skill can the air of a hospital ward be made absolutely pure. Dr. Hammond very justly says, "It is rarely the case that the wards of a hospital can, by any system of ventilation, be so free from carbonic acid, aqueous vapour, and organic emanations, that the contained atmosphere will be identical in composition with that of the outside of the building. It is too much to expect this." (*Treatise on Hygiene*, p. 425.) Where, for instance, a patient has smeared the floors and walls of his room with his own excrement, a whirlwind blowing through it, even after the most thorough cleansing, would not for many hours deprive it entirely of bad odours. Let it ever be borne in mind that ventilation is a poor substitute for cleanliness, and whenever we hear the former condemned we like to know if the fault were not in the latter.

Judgments respecting the efficiency of a hospital ventilation are often prematurely formed after a hasty inspection, instead of a deliberate examination under different circumstances. The first and perhaps the only disagreeable odour that meets the olfactories is apt to be accepted as conclusive proof of a failure. It might have been a casual, accidental incident arising from some unusual cause. Occasions are frequently occurring where the performance of the necessary service may leave behind for a few minutes something perceptible to the senses. We believe the cry of failure would not have been so often heard if those who raised it had more wisely apprehended the limits of the ventilating art. Unless we have some definite idea of what it can and what it cannot accomplish, our estimate of the measure of its success in any actual case is liable to mistake. If it be a failure to provide at the same moment an amount of air and warmth equally satisfactory to a large, corpulent, sanguine individual, and one meagre, languid, and dyspeptic; to one just refreshed by a ride and a mutton-chop, with a glass or two of sherry, and another who has been sitting quietly the whole morning; to one who has accustomed himself to all sorts of weather, and another morbidly afraid of draughts; to the officers and attendants of a hospital, rejoicing in the glow of health, and the patients wasting away by disease—then, no doubt, forced ventilation has sometimes proved a failure.

Another reason offered for distrusting forced ventilation is the fact that its friends disagree respecting the relative merits of the various methods in use. We do not dispute the premise, but we cannot accept the conclusion. If we should maintain that sewing machines are just a delusion and a snare because their respective friends claim for each superior excellence, or contend that vaccination should be abandoned because it sometimes fails to afford that security which has been claimed for it, we should be guilty of logic about as absurd as that. Where different methods are used for obtaining the same end, all with some degree of success, it is not strange that opinions differ as to their relative efficiency. The circumstances under which they act, the mode of their application, the opportunities for observing results, all may differ and thus obscure for awhile the question of relative success. Disagreement may be a sure step in the course of inquiry, for it leads to fresh research, and thence to improvement. To reject a good thing altogether because people differ as to its exact value, is generally prompted by a spirit of indolence rather than by a healthy scepticism.

We have heard the expense of a forced ventilation given as a reason for its omission by some who are obliged reluctantly to acknowledge its success. General hospitals, it is said, have very limited means; they are dependent on the charity of the public, and must, therefore, observe the

utmost frugality in all their arrangements. And this excuse is offered in cases where there would seem to have been no stinted outlay for every other purpose, not even that of architectural decoration. Like most good things, good ventilation, unquestionably, costs money; and if it is necessary to the best hygienic condition, as we believe it is, then it must be had regardless of expense. When we undertake to put the patients on a stinted allowance of food and medicine in order to save expense, we may talk of stinting their supply of fresh air, but not before. In fact, however, the cost of maintaining a forced ventilation in general hospitals is much less than one might infer from this excuse. A commission that examined the ventilation of the Parisian hospitals a few years ago, reported that the annual cost per bed varied from six dollars and seventy-five cents to about triple that amount. In the Pentonville Prison the ventilation was found to cost from a quarter to half a farthing per cell per day. In this country, where fuel is so much cheaper than in France, the cost would be much less; and wherever steam is employed for warming and domestic purposes, the additional amount required for running a fan or heating a chimney would make but a small item in the expenditures of the establishment.

To write about hospital ventilation without adverting to the one-story pavilions that have come into such sudden favor, would seem like acting the play with Hamlet left out. One of the advantages claimed for them is that of a better ventilation than is possible in buildings of two or three stories. Under what rule or principle of natural philosophy this could be expected, we are unable to see. It has arisen, probably, from the vulgar error of confounding quantity with quality, and supposing that if a patient has plenty of space, we need not concern ourselves about the qualities of the air. And yet, we never heard of a person fearlessly exposing himself to marsh miasmata, in the belief that having the whole heavens above and around him, he would be perfectly safe. Whether with a natural or forced ventilation, a large space overhead can lend no aid in renewing the air. For, of course, the larger the amount of air to be changed, the more active and powerful must be the agency employed in producing the change. Any deficiency here implies a lack of that steady movement of the air which marks a good ventilation, and also induces counter currents in all directions. Ridge ventilation, as it is called, must, under the most favourable circumstances, be disturbed by wind and rain and snow; and whoever supposes that the frequent closing and opening of valves and louvre boards required to meet these incidents will be properly attended to, can have no practical acquaintance with nurses and attendants.

In the arrangements for warming and ventilating the new one-story ward at the Presbyterian Hospital, in West Philadelphia, all notions on this subject, hitherto considered as settled, have been utterly discarded. The ward is warmed by direct radiation from hot-water pipes that run along the walls near the floor. The fresh air is admitted directly from the outside through holes in the walls below the level of the beds, and, of course, cold in cold weather. When more is required, resort is had to open windows. The foul air is supposed to find its way out through the openings in the ridge. No effort of ingenuity can prevent the fresh air from entering some of these openings, and thus producing a general mixture of foul air and fresh air. The ventilation is supposed to be promoted by four fire-places, as it undoubtedly will be, in a small degree, while there

is fire in them. The water-closets are supposed to be ventilated through the windows when left open. As if to increase the expense of warming, the space between the floor and the ground, corresponding to the cellar, is swept by the winds of heaven through many large openings in the walls.

Precisely what form the supplementary force should take must depend, in a great degree, on the circumstances of each particular case. The most economical, certainly, is that of a tall chimney heated by the smoke and gases of the fires used in the house, into which the foul air is discharged, and the hotter and higher it is made, the greater will be its power. This has the advantage of utilizing heat that would otherwise be wasted, of being constantly in operation, and of requiring no additional attendance. Where steam is not used, the kitchen chimney may, generally, be so contrived as to do the work, and if it prove insufficient for the purpose, additional heat can easily be provided. To examine the various ways of adapting these general methods to actual practice, forms no part of our present purpose. This is the business of the architect and builder aided by the results of scientific investigation, and profiting by experiments already tried. We have cared only to meet the pressing necessity of the time, that of re-affirming the great fundamental truth—as well established, certainly, as any truth can be, by principle and practice, though strangely ignored just now—that a ventilation forced by some artificial means is absolutely necessary to the highest sanitary condition of a general hospital. I. R.

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ART. XXIII.—*Researches into the Antagonism of Medicines; being the Report of the Edinburgh Committee of the British Medical Association.* By JOHN HUGHES BENNETT, M.D., F.R.S.E., Hon. Fellow of the King's and Queen's Coll. of Phys. in Ireland, etc., Chairman and Reporter. 8vo. pp. 100. London: J. & A. Churchill, 1875.

THIS handsome brochure of a hundred pages is a reprint from the *British Medical Journal*, in which the Report originally appeared, and where it has doubtless been perused by many of our readers. A brief abstract of its contents has already been given in the "Quarterly Summary" of the *American Journal of the Medical Sciences* for January and April, 1875, so far as the results of the experiments had been then reported. We embrace the present occasion for a rather more extended notice.

In his opening article, Dr. Bennett alludes to his former Report to the British Association, made in 1868, "On the Action of Mercury on the Biliary System," and he thinks that the results of his investigations at that time "finally settled the long disputed subject, and demonstrated, beyond the possibility of reasonable objection, that in this respect mercury has none of the properties that have so long been attributed to it."

We do not propose to open this question at present. We have not forgotten the stir that this announcement made in the profession at the time. We remember that many were disposed to yield up their long-cherished convictions on this point to this eminent authority; whilst many others—and we apprehend their number has not diminished—still declined to relinquish the use of a remedy of whose value they believed they had witnessed the most ample proofs.

The Committee, whose Report is embodied in the present volume, was appointed in 1869. It was composed of gentlemen eminently qualified for the important work entrusted to them. Several years of labour were devoted to its various details; and when we are informed that no less than *six hundred and nineteen* experiments were performed upon living animals (where were the *anti-vivisectionists?*), and the results carefully watched and tabulated, the reader may get some faint idea of the magnitude of the labours and the length of time involved in the investigations, although none but those who have actually performed such work can adequately appreciate it; for as the author correctly observes, "even the account of the investigations themselves, with the tabulated results of the experiments, can give only a feeble conception of the laboratory-work accomplished." With such evidence of the carefulness and accuracy of these experiments, it is impossible to withhold our assent to the conclusions arrived at, at least so far as the lower animals are concerned; for we are not of the opinion that the results of experiments of this nature made upon animals—even those most closely allied to man, such as the dog, the cat, and the rabbit—can always be predicated upon the human subject. We venture this assertion, after some experience of our own in this line.

The following list comprises the different substances between which the *antagonism* was sought to be established:—

1. Hydrate of chloral and strychnia.
2. Sulphate of atropia and Calabar bean.
3. Hydrate of chloral and Calabar bean.
4. Hydrochlorate and meconate of morphia and Calabar bean.
5. Sulphate of atropia and meconate of morphia.
6. Meconate of morphia and theine.
7. Meconate of morphia and caffeine.
8. Meconate of morphia and guaranine.
9. Meconate of morphia and infusion of tea.
10. Meconate of morphia and infusion of coffee.
11. Extract of Calabar bean and strychnia.
12. Hydrate of bromal and atropia.

These different substances were introduced into the animals hypodermically, except in the case of the infusions; here, the bulk of the article precluded the hypodermic method, and it had to be injected into the stomach through the œsophagus. As might have been supposed, vomiting usually followed this method of administration, and the experiment failed in consequence of the rejection of the article. We here recall the beautiful experiments of Orfila, made upon dogs, for the purpose of detecting certain poisons by their physiological actions. This authority strongly recommends tying the œsophagus in cases where the poisonous substance is introduced into the stomach; assigning as a reason the very difficulty above referred to—the liability of the animal to vomit. (*Toxicologie*, 1852, i. p. 53.)

The general scope of Dr. Bennett's experiments, as in the case of those of Dr. Fraser, previously performed (*Trans. Royal Society of Edinburgh*, vol. xxvi.), had reference to the establishment of the following points: first, the physiological action produced; secondly, the minimum fatal dose of the two medicines used to antagonize each other; thirdly, the influence of the supposed antagonistic substance upon the other, when both were *simultaneously* injected; fourthly, this influence when the antagonistic substance was injected *before* the fatal one; fifthly, this influence when

the antagonistic substance was injected *after* the fatal one; sixthly, the limits of the antagonism, when such existed; and, lastly, to verify, in every case, the supposed antagonism by a crucial experiment performed upon the animal supposed to have been saved by the antidote, by administering to him hypodermically the same dose of the poison several days after his recovery; if death then took place, the conclusion was that there was a true antagonism between the two substances employed.

Our limits will only allow us a brief notice of some of the interesting and important results arrived at.

*Antagonism between Hydrate of Chloral and Strychnia.*—The result of repeated experiments showed that in rabbits the average minimum fatal dose of strychnia is $\frac{1}{96}$th of a grain for every three pounds weight, or $\frac{1}{288}$th of a grain for every pound. (This would correspond to a little over half a grain for a man of 150 lbs. weight; and half a grain is known to have destroyed an adult man.) The minimum fatal dose of hydrate of chloral was found to be twenty-one grains for a rabbit weighing three pounds. When these two substances were administered *simultaneously*, the antagonizing influence of the chloral hydrate was very obvious; in many instances, a dose of strychnia, *more than three times larger* than the minimum fatal one, being completely neutralized by a dose of chloral varying from eight to nineteen grains. Even in those cases where the antagonism was not complete, the influence of the chloral was very manifest, both in prolonging life, and in modifying the symptoms.

When the hydrate of chloral was injected *some time after* the administration of the strychnia, it was found that its antagonizing effect was materially lessened, in proportion to the length of the interval between the two doses. In fact, if the antidote was withheld until after the physiological effects of the strychnia (tetanic spasms) showed themselves, the animal rarely, if ever, survived; death occurring apparently from asphyxia caused by spasm of the respiratory muscles. In no instance was life saved when the interval was so long as ten minutes and upwards. This fact is, of course, one of great therapeutic importance. In cases of strychnia poisoning in the human subject, the patient should be brought under the influence of chloral hydrate as speedily as possible, either by subcutaneous injection, or, according to the author, "even by the direct introduction of the substance into a vein." As regards the latter method, however, we must confess to some misgivings. Several cases of the successful use of hydrate of chloral as an antidote to strychnia poisoning have already been reported in the journals.

As regards the antidotal influence of strychnia over chloral hydrate, the results of the committee's experiments (fifteen in number) would seem to be less satisfactory than those of the converse character, although there is positive proof of some antagonism. According to the author, "there is little hope of saving life after fatal doses of chloral hydrate, by the subsequent injections of strychnia." And the reason seems obvious, when we remember that while the former acts both upon the spinal centres and the brain, the latter (strychnia) exerts no known influence on the brain, and therefore cannot relieve the coma and congestion of the encephalon; "and consequently, even though there may be muscular twitchings, and even tetanic convulsions, the animal dies comatose."

An interesting case of the apparent antidotal power of strychnia in chloral poisoning is reported by Dr. E. Levinstein (*Centralbl. für Med. Wissen.*, 1875, No. 17). A man who had taken six drachms of chloral

was found half an hour afterwards in a deep sleep; subsequently there was tumultuous action of the heart, which organ soon became extremely enfeebled; the respiration was difficult and laboured; pupils greatly contracted; temperature reduced to 91.2°. Artificial respiration and faradization proving unavailing, two doses of strychnia were administered hypodermically, of one-twenty-second of a grain and one-thirty-second of a grain respectively, at short intervals. The result was convulsive movements of the muscles, increased cardiac impulse, rise of temperature, and dilatation of the pupils. Artificial respiration had, however, to be kept up for eight hours. Trismus and tetanic spasm remained for eight hours after the second injection; but at the end of thirty-two hours the patient awoke, feeling fresh and well.

*Antagonism between Sulphate of Atropia and Calabar Bean.*—The results under this head in some respects resemble those reported by Dr. Fraser, in the paper already referred to, and which was reviewed in this Journal (Oct. 1872). The area of antagonism was found to be more limited than that indicated by Dr. Fraser; and, in the opinion of the author, "for all practical purposes atropia as an antidote to Calabar bean is useless, and not to be compared with the effects of chloral hydrate." The experiments of Dr. Fraser, however, seem to demonstrate very clearly their physiological antagonism: "A dose of physostigmia, three and a half times greater than the minimum fatal, is completely neutralized by an exceedingly small (comparatively) dose of atropia—one-tenth to one-fifth of a grain." This authority recommends that in cases of poisoning by Calabar bean, atropia should be administered hypodermically, one-fiftieth to one-fortieth of a grain, and the dose repeated until dilatation of the pupils is observed (*loc. cit.*).

As regards the antidotal power of *Hydrate of Chloral over Calabar Bean*, this would "seem to be limited, in all cases, by the conditions: 1. *By the dose administered;* more than a minimum fatal dose of the extract of Calabar bean destroys life, notwithstanding the administration of chloral hydrate. 2. *By the interval of time between the administration of the two substances.*" Life may often be saved when they are given simultaneously, while there is very little, if any, chance of escape for the animal if the chloral be given more than eight minutes after the fatal dose of Calabar bean. But even in the fatal cases, the convulsive effects of the latter poison are decidedly modified.

*Antagonism between Atropia and Morphia.*—This has been the subject of inquiry by numerous experimenters, among whom may especially be mentioned Dr. John Harley and Dr. Fraser in Great Britain, and Drs. Mitchell, Keen and Morehouse in our own country. The results, however, have been somewhat contradictory.

A large number of experiments, varied in many particulars, were performed by the committee with a view to settle this vexed question. The conclusions arrived at are: that atropia is antagonistic (in rabbits and dogs) to morphia, only within a limited area; life may even be sometimes saved by the use of the former after a fatal dose of the latter. Morphia does not act beneficially after poisonous doses of atropia—the tendency to death being greater, in these cases, than if a large dose of either substance had been taken alone. The benefit arising from the use of atropia after a large dose of morphia is probably due to the action of the former upon the bloodvessels, "causing contraction of these, and thus diminishing the congestion of the brain and spinal marrow." The author thinks that

"in man, sulphate of atropia would be too dangerous and uncertain a remedy to depend on in cases of poisoning by opium, or any of its salts." This is also the opinion of Dr. John Harley (*Old Vegetable Neurotics*, p. 309); but it does not quite accord with the conclusions of Drs. Mitchell, Keen and Morehouse, as detailed in this Journal (January, 1865). The profession appears to be about equally divided as to the belief in the efficacy of these two substances as antidotes to one another, in man. Certainly a long array of cases might be cited where the fatal effects of each *appeared* to be neutralized by the timely administration of its fellow.

Some experiments performed by ourselves with these two substances, on dogs, in 1870, and reported in this Journal (April, 1871), exhibited a certain amount of antagonism. "In one of these trials, in which four grains of morphia were injected subcutaneously, narcotism was fully produced in one hour; when four grains of atropia were similarly administered, the animal became paralyzed in an hour, but showed no disposition to spasms. In twenty-four hours he had completely recovered, with the exception of a slight dilatation of the pupils."

On one point in this connection, the results of Dr. Bennett's experiments on the tolerance of the dog for atropia are singularly at variance with those of Dr. Frazer, as given in his paper already alluded to. While the former states (p. 39) that "three-fourths of a grain of sulphate of atropia, administered hypodermically, will kill a dog weighing 14 or 15 pounds in about three hours, the experiments of the latter demonstrate the fatal dose to be *fourteen or fifteen grains*. Both authorities give *twenty-one grains* as the minimum fatal dose for rabbits. Our own experiments (above alluded to) coincided with those of Dr. Frazer. In one case, *eight* grains of atropia were introduced, in two equal doses, within forty-five minutes; the animal perfectly recovered in twenty-four hours. In another case, *fourteen* grains of atropia were introduced within one hour into the subject of the first experiment (some days after his recovery); from the effects of which he again completely recovered in the course of a few days.

Not the least interesting of the researches of Dr. Bennett and his colleagues are those pertaining to the physiological action of *Cocaine*, *Theine*, *Caffeine*, and *Guaranine*, and the *Antagonism of these substances with the Salts of Morphia*. The four bodies first mentioned closely resemble each other in their chemical composition. There was found to be a striking correspondence, likewise, in their physiological properties. An extended series of experiments demonstrated the following as among the most important results, on frogs, mice, rabbits, and cats: 1. Loss of motor power and of sensibility; the former, however, "not due to paralysis either of the motor columns of the spinal cord, the motor nerves, or the muscles; the latter due to a true paralysis of the sensory column of the cord." 2. Enlargement of the capillaries, both of the surface and in the interior of the body. This was shown by the general congestion of the body, and was manifestly due to paralysis of the vaso-motor nerves, causing dilatation of the vessels. 3. Diminished action of the lungs and heart. 4. In large animals (cats and rabbits), increased salivary secretion. 5. Generally, a contraction of the pupils. 6. Tenesmus, accompanied by a copious discharge of clear mucus from the bowels. In cats, there was a much greater degree of cerebral excitement than in rabbits.

As regards the antagonism between these different substances and *morphia*, the result of the experiments may be summed up as follows: An

antagonism does undoubtedly exist, but it is confined within a limited area; for if a dose of morphia slightly above the minimum fatal be given, the animal rarely survives, even though a full dose of the antidote be administered similtaneously, or soon afterwards. And, further, if the dose of the antidote (theine or caffeine) be greater than their minimum fatal one, death is very apt to occur with symptoms of poisoning by the latter. The minimum fatal dose of theine or caffeine, for a cat of average size, is about five and a half grains.

Experiments were also made to determine the antagonism between morphia and a strong infusion of tea, and a decoction of coffee, with a view to therapeutic deductions in reference to the employment of these latter substances as antidotes in opium poisoning. As has been already remarked, there was great practical difficulty in administering these liquids to the animals (dogs) by injection into the stomach, in consequence of their strong tendency to vomit. In a few instances, however, where, by several repetitions of the experiment, the liquid was retained, the result was very satisfactory; the narcotic effects of the morphia appeared to be controlled by the antidote. The animal, instead of evincing the stupor and coma characteristic of morphia, was very restless and irritable. In connection with the latter experiments, the author quotes an interesting case reported by Professor Sewell, of Quebec, in the *Lancet*, of 1866: A lady aged 34, had suffered severely from angina, to relieve which she had accustomed herself to enormous doses of chloroform by inhalation. On one occasion, she substituted for the chloroform two drachms of Battley's sedative solution of opium every half hour, or *fourteen drachms* in the course of seven hours—equivalent to over 60 grains of opium. When seen a few minutes after, the coma was perfect; pupils contracted to a pin's point; body perfectly cold to the waist; pulse imperceptible; respiration *two in three minutes*. Half a pint of very strong infusion of tea was now administered per rectum. In twenty-five minutes, the pulse returned at the wrist; the face was less pale; respiration, *six in the minute*. The enema was now repeated; and in four hours from the commencement of the attack, the patient was able to speak, and was shortly out of danger. The same writer alludes to three cases of alcohol poisoning in children. Coma was complete in two of them; but they were all restored to consciousness by the use of the same remedy, in an hour or less. Its use is also suggested in puerperal convulsions, and in those arising from uræmic poisoning.

*Antagonism between Bromal Hydrate and Atropia.*—The chief physiological differences between chloral hydrate and bromal hydrate are the following: bromal hydrate is from four to five times more powerful than chloral hydrate; it never produces hyperæsthesia, and anæsthesia only when the animal is profoundly comatosed; it always contracts the pupil, which chloral hydrate seldom does; it acts less vigorously on the cerebral hemispheres, and more on the ganglia at the base of the brain; hence, it frequently causes convulsions, which chloral hydrate never does. The author regards the action of bromal hydrate and morphia on one another as "a clear example of physiological antagonism." He explains it thus: "Death from the effects of bromal hydrate is due almost invariably to the accumulation of the saliva and mucus in the air-passages. This may be so excessive as to cause death by asphyxia. The convulsions which usually occur are due to asphyxia. Atropia arrests this secretion, partly by diminishing the action of the salivary glands, and also by contracting the bloodvessels generally." In this way it sometimes happens that

atropia may save life after a fatal dose of bromal hydrate; "though the converse does not apparently hold good, since there was always a failure to save life after a fatal dose of atropia, by the subsequent injection of bromal hydrate."

In taking leave of this interesting and instructive volume, we cannot withhold our admiration for the rare amount of persevering labour and skill bestowed upon these researches. We cordially unite with the author in trusting "that no parsimony nor error in administration will restrain the British Medical Association from continuing the noble efforts it has commenced, and rewarding by liberal grants the arduous efforts of men who will dedicate themselves to these pursuits." J. J. R.

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ART. XXIV.—*Circular No.* 8. *War Department, Surgeon-General's Office*, Washington, May 1, 1875. *A Report on the Hygiene of the United States Army, with Descriptions of Military Posts.* 4to. pp. lvii., 566. Washington: Government Printing Office, 1875.

THIS bulky volume, designated as Circular No. 8, emanates from the Surgeon-General's office in the War Department. The report proper is prepared by Dr. John S. Billings, Assistant Surgeon, U. S. A.

We are very glad to welcome a general order from the War Department, dated November 17, 1874, which will greatly strengthen and encourage post-surgeons in their efforts to prevent disease. Heretofore, sensitive men have shrank, sometimes with too much reason, from complaints, investigations and recommendations which might seem to the non-medical judgment of the commanding officer trivial or officious. Now, however, it is made the duty of each surgeon to make a monthly examination into the sanitary state, conditions, and surroundings of his command. The results, together with such recommendations as seem likely to benefit the health of the command, are ordered to be embodied in a report to the commandant. If this officer decline to act upon recommendations in the surgeon's monthly report, he is to endorse upon it the reasons of his refusal, and forward to the department commander, furnishing also a copy of endorsement to the medical officer for his records. If, on the other hand, recommendations are acted upon, that fact shall be noted in the medical records. We regard this order as one of very great importance, both to the health and efficiency of the army, and to the dignity and honour of the profession.

That our army offers a fitting field for hygienic work, becomes startlingly apparent when we learn that among these picked men, selected after careful examination and the rejection of all that present any signs of weakness or disease, there occurs a mortality from illness alone, fifty per centum greater than the average among men from twenty to forty years old, in the whole country.

Glancing at the principal influences affecting the soldier's health and comfort, Dr. Billings refers to his habitations, his food as provided and prepared, his clothing, and his hospital accommodations. The quarters, whether in barracks or casemates, are, as a rule, too thickly populated, wholly destitute of ventilation, other than by doors and windows, often badly located, and generally deficient in many things needful for a healthful

human habitation. The effects of bad air are strikingly manifest. A remarkable instance is quoted where soldiers on the same post, with the same water, food, cookery, duties, exposures, and the same surgeon, presented a curious discrepancy in the amount of illness reported. Two companies occupied barracks which could be made, and were made for warmth's sake, almost air-tight. Two others were in quarters so rudely constructed that cold draughts poured in through many crevices, to the disgust and discomfort of the men. Yet the sick-list of the latter was but one-half that of the former.

Dr. Billings expresses the deliberate opinion that at least one hundred men are lost to our small army yearly, by death and discharge, through diseases due to bad air. The class of diseases most directly traceable to poor ventilation are lung troubles.

We believe our readers will be both surprised and indignant to learn that in time of profound peace neither pillows nor sheets are furnished for the bunks of our soldiers. The folded over-coat does duty for the former, and blankets, which are "seldom washed," for the latter. The bed-sacks are usually too short, and we can readily believe Col. C. H. Smith, when he bears witness that "no amount of too short bed can make a man comfortable."

Notwithstanding successive improvements, the army ration is yet believed to be deficient. It is true that by sale or exchange of certain portions, and by establishment of post gardens, its short-comings can often be rectified. An absolute increase in the dry-weight, together with certain modifications in the composition, are advised. More soft bread, fresh meat in greater proportion to fat bacon; and the addition of potatoes, or, failing these, dried fruits, together with canned milk or cheese as alternative for peas and beans, are some of the changes recommended. A tendency to save too much off the rations should be prevented by strictly forbidding any expenditure of the company fund thus acquired for any other purposes than procuring a varied diet. Some things now purchased out of these funds ought to be furnished by the quartermaster's department. To the civil apprehension, there is no more justice in making the soldier pay for his knife and fork than for his bayonet.

Improvements have been making in the clothing issued to troops; and our army was never better clad than at present. Different styles, adapted to the extremes of heat and cold, might be employed with advantage.

In regard to hospitals, we note the following statements as possessing some interest in view of recent and present discussions. "The 'pavilion plan,' which for a time was supposed to be a perfect panacea against all evil, has been found, by sad experience, to furnish no security against the evils summed up in the word 'hospitalism.'" The author then goes on to speak with apparent approval of temporary wooden "barrack hospitals," to be torn down every ten years. These, however, he believes not practicable in cities where space is valuable. A description of a new hospital of three stories in Washington serves to illustrate the writer's views of hospital construction. This is heated by hot-water and ventilated by tall chimneys of large size, containing smoke-flues to create a current.

Dr. Billings' report, though occupying only one-tenth of the volume, contains much valuable and curious information and many brief but very suggestive hints. To the matters giving occasion to some of these last we shall refer again.

The bulk of this work is due to the descriptions it contains of over two

hundred military posts, scattered all over our country, in every possible variety of climatic and hygienic condition. These are prepared by medical men, and aim at presenting not only the general facts regarding the different localities, but especially all such circumstances as can have any bearing upon the health of troops there stationed. Appended to each is a table giving temperatures and rainfalls, during four official years from 1870–1 to 1873–4; also a table showing mean strength of garrison, with cases and deaths distributed under twelve or fifteen disease-headings, during the same periods. In looking at the latter, one is struck with the immense variations occurring in successive years at the same posts, not only in the total annual sick-report, but in the proportionate prevalence of particular diseases. For many of these discrepancies, one can easily imagine a sufficient reason. Unfortunately, however, no explanation whatever is generally offered in the text which accompanies the tables. One year's garrison may be a fine set of fellows from a crack regiment, healthy, spirited, disciplined, and self-respecting; while the next may be a poor lot of varlets, demoralized by bad luck, bad discipline, or a dozen other causes, so that they are fit for nothing but complaining. Or one company may bring firm health from their previous post, while the next may be just reaping the fruits of exposure in some unwholesome district. Different years, even at the same post, present considerable variety in the climatic and other disease-producing influences. These and other considerations may be conceived to be sufficient to account for the extraordinary discrepancies observed; but surely we should not have been left wholly to our own conjectures. When in a table we find six times as much rheumatism one year as another, why may we not find some reference to the fact and its causes in the ample text of the accompanying description?

A few instances of unexplained variations may be cited. Thus at Fort Porter, one year the number of sick is three or four times the garrison strength, and another year only about two-thirds that strength. At Fort Wayne, we find cases of disease, year 1870–71, 393 to garrison of 190; two years later, 85 cases to 201 men. The difference in this case, to be sure, is principally, though not wholly, due to variation in intermittent fever, which fell from 214 to 32; but even of this, some explanation would have been acceptable. At Willet's Point, New York, we find in 1870–71, with a garrison of 281, 708 cases of illness, including intermittent 214, rheumatism 40, catarrh and bronchitis 68, diarrhœa and dysentery 169; while three years later a population of 260 gives 283 cases, including, of the four denominations just named, in the same order, 57, 18, 14, and 28. Newberry, N. C., shows in three years a falling off of intermittent from 274 cases in 190 men, down to 25 in 143. At St. Augustine, while the garrison was more than doubled, the number of cases of intermittent was diminished by three-quarters, and rheumatism by one-half. At Fort Lyon, Colorado, in one year, while the garrison increased only from 156 to 214, cases of catarrh and bronchitis rose from 7 to 112, and bowel-complaints from 11 to 69. At St. Louis, while population doubled, catarrh and bronchitis were divided by three, and diarrhœa and dysentery very nearly as much diminished; and these last, *again* suffered a four-fold increase. Fort Russell, Wyoming, with a garrison rising from 515 to 576, gives us in catarrh and bronchitis a rise from 39 to 297, rheumatism from 33 to 95, diarrhœa and dysentery from 24 to 114, "other local diseases" from 78 to 376, and "other diseases of this [general diseases, A.] group" from 24 to 220: total cases, rising from 287 to 1278! In two and a half

closely printed pages of interesting and valuable information about this post, the only words having the slightest possible bearing upon the remarkable differences above noted—all occurring between 1871–72 and 1872–73—are the statements that the post is a sort of distributing centre for troops, and that the garrison and the commandant have been several times changed. No reference is made to the variation of the sick-reports. We have noted many other instances of this curious sin of omission, occurring all over the country, but believe enough have been given. Perhaps we should state that the strength of garrison is expressly given as the "mean strength," for each year.

If in future some little attention be given to the interpretation of the tables, much may be added to the value of this already admirable kind of publication.

We were desirous of tracing the influence of living in casemates upon the health of soldiers, by comparing the sick-reports of troops occupying them with the reports from garrisons occupying wooden barracks. In view, however, of the extreme variations met with in the same posts, we felt that any such attempt could hardly obtain any trustworthy results. We can only give the impressions of the reporters themselves. These are very strongly adverse to casemate quarters. Their dampness is generally very great, causing iron to rust and clothing to mould and decay. Catarrhal and rheumatic affections are believed to be often caused by the chilly dampness of the air, while ventilation becomes more than usually defective.

In most cases where the ventilation of their quarters has at all attracted the attention of the post-surgeons making these reports, the testimony borne fully sustains the more general but emphatic utterances of Dr. Billings. Not only is the cubic space per man almost uniformly too small, but as a rule no provision has been made for the introduction of pure air. Doors, windows, and crevices usually form the only means of changing the atmosphere. In cold climates these are carefully closed by the men for the purpose of retaining heat. In one place "base-burning" stoves were so constructed as to allow free emission of carbonic acid gas, which so contaminated the air as to kill healthy goldfish on four different occasions after six hours' exposure. Many reports mention the foulness of the barrack atmosphere, though very few give the results of exact tests.

In this connection, we may advert to the disgraceful arrangement of the guard-houses nearly everywhere. It seems as if these had purposely been made comfortless and unwholesome, not only for prisoners but for men on guard duty. At one post cells are described as "chilly, stony dens, worthy of the dark ages." After a night's occupancy we are told that a candle placed on the floor is "nearly extinguished" by the accumulated impurities. At another post the prisoners' cells, 8 feet by 3 feet 6 inches, and 9 feet 5 inches high, have no other ventilation than a single grated aperture over the door of each, six inches square. In one guard-house fifty-six prisoners are confined in three rooms, two being 9 feet 8 inches by 8 feet 9 inches, and the third 20 feet 9 inches by 17 feet, and all 11 feet 8 inches high. The larger room has no opening save a single grating over the door. This being only three miles below New Orleans, we can readily believe that "recovery from even slight sickness" is "almost impossible" to a prisoner, without removal. A Texas guard-house is reported with ventilation for two prisoners, though usually occupied by twelve. At a

post in the warm climate of central Tennessee, two "close boxes" 11 feet by 11 feet, and 11 feet by 15 feet, aired only by auger-holes in ceilings, floors, and sides, have been made to hold "thirteen suffocating wretches." We can easily believe that "during the still, hot nights of summer the sufferings of the prisoners are very great." Perhaps the champion torture-boxes, however, are those at Fort Craig, New Mexico. These measure 5 feet 7 inches by 2 feet 10 inches, and are 4 feet 10 inches high! Eight auger-holes, and the chinks round the door, are the only sources of air and light for each cell. Several other posts have cells dependent on auger-holes for air. One "dark cell," 8 feet by 10 feet, has "no ventilation but the door;" and another, 5 feet 1 inch by 6 feet 1 inch, "only cracks in the doors."

It is true that usually these separate cells are only used for the worst cases, the ordinary "prison-rooms" being considerably less horrible. But we submit that the existence of such places is a burning shame and a disgrace upon our civilization.

One or two reporters speak out plainly against the absurd and cruel custom of denying to soldiers of the guard, while off duty or waiting their turn, any softer bed than a plank. One commandant, in deference to his surgeon's views, allowed straw-sacks in place of bare boards.

We are glad to notice that the importance of a pure water for drinking and cooking seems to be very generally realized. A number of instructive instances are reported where measures to preserve springs from contamination or to provide a supply from purer sources, have produced a marked improvement in the health of the post almost immediately. Thus at Fort Barrancas, after four or five cases of typhoid had appeared, water suspected of fæcal contamination was disused, and rain-water provided instead, with the results that no more fever appeared, and bowel troubles were diminished one-half. At Fort Bayard intestinal diseases were much diminished after judicious measures taken to keep filth out of the springs, and to filter the water before using.

We learn that it is a practice in the Territories peopled with descendants of Spanish colonists and invaders, to cool drinking water by placing it in porous jars, which, placed in the shade, cool their contents by rapid evaporation from their surface. This custom is generally adopted at the military posts, and is by some surgeons deemed more wholesome than the use of ice-water.

In some forts, especially where space is very limited, as upon small islands, the device known as "earth closets" has been found perfectly successful. No other method of dealing with ordure, within casemates, has been so free from offence. At one post they were tried and abandoned, as requiring too much care and trouble; but here there was really not much need for them, as the tide washes to and fro into its privy-vault.

As most of our military stations in the Territories are at great elevations, we looked for much valuable observation as to the influence of altitude upon health, and upon disease. Very few reporters, however, appear to have devoted any attention to the physiological action of a rarefied atmosphere. At Fort Garland, Colorado, nearly one and a half miles above the sea, in the average healthy man there is a slight increase in the frequency and the depth of inspiration. Average pulse, in fifteen healthy subjects, ninety. Marked increase of heart-action follows even slight exercise. An observer at Santa Fé, over one and a quarter miles above the sea, says new comers are "almost invariably affected by a great oppres-

sion in respiration," together with lassitude. Threatenings of paralysis have also been attributed to elevation. On arriving at a post near the last-mentioned, and about as elevated, the surgeon was attacked with dizziness, confusion of ideas, mental hebetude, and headache. Temporary relief followed purgatives. Hemiplegic symptoms, with oppression of breathing, throbbing of carotids, and dilatation of pupils, then appeared; relieved by chloroform inhalations, but several times recurred, in an alarming form. Under cathartics and restricted diet, however, the attacks finally ceased. As to the moderate increase in frequency of pulse and respiration among the soldiers near Salt Lake City, Surgeon Vollum is inclined to seek its cause in the liberal use of tobacco, rather than in the rarefied air. The elevation here is 4904 feet, or less than a mile. At Fort Steel, Wyoming, normal respiration is said to be deeper than at sea-level, but not quicker; elevation 6700 feet.

Although we have probably two-score reports from elevated posts, the above notes comprise almost all the physiological observations recorded.

Concerning the influence of altitude upon disease, the amount of testimony is considerably greater, though not at all universal. Of course, the other peculiarities of the mountain climates will affect the progress of disease, in a way not always separable from the action of a rarefied atmosphere. Very great dryness of air is often present; and partly as a result of this, extreme variations of temperature between day and night. Space forbidding detail, we will simply say that while the mountain climate, combined with mountain life, very often arrests commencing phthisis and cures asthma, it usually hastens death in advanced consumptive cases, and is unfavourable to heart diseases The extreme dryness of the air often seems directly to irritate the bronchial mucous membrane. The "sand storms" of certain localities are still worse. The very great variations of temperature are very generally credited with causing rheumatic troubles (usually subacute, and most often muscular), catarrhal affections, and bowel-complaints. The latter are often traced to exposure to the cold night air, on guard, after days of debilitating heat. One observer believes that phthisis never originates in Utah; and knows some two dozen cases of asthma wholly relieved during residence there.

A "mountain fever" is commonly spoken of. Some regard it as a form of remittent, while others incline to term it typhoid. It is of a mild type and amenable to quinia.

We are surprised to find one excellent reporter stating that erysipelas, at Fort Steel, Wyoming, 6700 feet above the sea, is undoubtedly more frequent than at lower frontier posts; and apt to complicate the most trivial injuries.

The alkaline waters of the upper Missouri are believed by Asst. Surg. Williams to be innocuous. Bronchocele, however, is very frequent among certain Indian tribes which have for generations drunk of these waters.

The intensity of summer heats, and the range of temperature at all times, are something wonderful, at many of these Rocky Mountain posts. A monthly range of 70° is common, especially in winter; and even reaches 96°!

Fort Yuma, just above the head of the Gulf of California at junction of the Colorado and Gila Rivers, is the hottest (and driest?) post in the United States. In April, May, and June no rain falls. With mercury at 105°, as it often is, scarcely any sensible perspiration appears, and the skin is dry and harsh, and the hair crispy. A temperature of

100° may be reached daily for weeks without causing illness; the *mean temperature* for July, 1870, was 98°.53. Furniture brought from the North, falls to pieces. Newspapers become brittle and require great care in handling. Eggs dry up in their shells—giving rise to the scandal that Fort Yuma hens lay hard boiled eggs. Ink dries on the pen. No. 2 Faber pencils will not make a mark unless soaked in water, and are used alternately in pairs, one in a vial of water, while the other is used till it dries. Five or six months in each year, show a maximum of over 100°, such as 110°, 111°, 112°, and so on up to 119°! According to statement of reporter, and certainly according to the tabulated returns, the post is by no means unhealthy.

A great amount of information as to the natural history of the Territories and Pacific States; and some interesting descriptions of the nobler and less contaminated aboriginal tribes, are contained in some reports. Concerning these we had designed to speak, but lack of space forbids. Especial points of interest in particular reports have been noted, but must now be reluctantly omitted.

We hope that, in criticising some features of this Report, we have not seemed inappreciative of its great value. Its faults are those of individual reporters, or more properly speaking, perhaps, are such as almost inevitably occur in doing a new kind of work. The mass of valuable observations presented is enormous. One thing, however, is sadly missed—an index. If you desire to see all that is said, for instance, about "consumption" or "phthisis," you must turn carefully over nearly six hundred pages; and so of "elevation," "bears," etc. Absolutely the only guide to this ponderous volume, is an alphabetical list of the posts described.

B. L. R.

# ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XXV.—*Saint Bartholomew's Hospital Reports.* Edited by JAMES ANDREW, M.D., and THOMAS SMITH, F.R.C.S. Vol. X. 8vo. pp. xliv., 420; x., 82. London: Smith, Elder & Co., 1874.

THE present volume, which is announced as the first of a second series of the *St. Bartholomew's Hospital Reports*, is both more portly and more elegant in appearance than any of its predecessors, and thus tempts us to hope that the "Reports" have proved an exception to the rule which commonly obtains in regard to works of a similar nature, and that their success has not been limited to one of a scientific character.

Prefixed to the papers of strictly professional interest, is an appreciative memoir of the late Mr. Thomas Wormald, contributed anonymously, but evidently by one who well knew the man of whom he wrote. A pupil of Abernethy, Mr. Wormald seemed to have acquired many of his preceptor's peculiarities of manner, as well as his surgical doctrines. He wrote little, and was, therefore, less known out of his own circle than many surgeons of inferior merit. He was born in 1802, and died in 1873, and his connection with St. Bartholomew's Hospital, as pupil and teacher, lasted for nearly half a century.

Following our custom, we shall consider separately, the papers of *surgical* and those of *medical* interest, and shall first invite attention to a short communication *On Disease of the Mammary Areola preceding Cancer of the Mammary Gland;* by Sir JAMES PAGET, Bart., F.R.S. The condition of the areola described by Sir James Paget has been observed by him in about fifteen cases, and in each instance cancer attacked the corresponding mammary gland within two years. The disease began in every case as an eruption on the nipple and areola, giving usually the appearance of a very red, finely granular, raw surface, as if the part had been deprived of its epidermis, and not unlike the appearance of the glans penis when attacked by acute balanitis. The affection was attended by the exudation of a clear, yellowish, viscid substance, and the patients experienced a sensation of burning, tingling, or itching, but without any disturbance of the general health. The eruption in this form never extended beyond the areola, and in only one instance did it pass into a deeper form of ulceration. In other cases, in which the eruption resembled an ordinary eczema, or a psoriasis, it spread beyond the areola in widening circles or in scattered blotches. The practical inference from Sir James Paget's paper, and one which he apparently favours, though he does not draw it in stated terms, is that when these peculiar appearances of the nipple and areola are noticed, the part should be removed in the hope of preventing the development of cancer.

The next paper is on *The Treatment of Secondary Hemorrhage after Ligature of the Femoral Artery in Continuity;* by WILLIAM HARRISON CRIPPS. This is a statistical paper, founded on an analysis of fifty-three cases which the author has collected from various sources, and which he has classified according to the plan of treatment adopted. In speaking of the futility of tying

the iliac artery for hemorrhage from the femoral, Mr. Cripps relates a very striking experiment which may serve incidentally to show the opponents of vivisection, the important bearing which experiments upon the lower animals may have upon practical surgery. To illustrate the tendency of blood to pass through arterial anastomoses rather than towards the capillaries, the author says—

"If water be injected into the common iliac artery of a rabbit, it will circulate through the capillaries, returning by the vein. If the external iliac and the superficial femoral be now tied, the water will still return by the vein, only much more slowly.

"If the femoral artery be now divided below the ligature, and water still injected by the common iliac, it will be found that a greater quantity of the water will return through the cut (lower) end of the femoral than by the iliac vein. This experiment shows, at least in the case of a rabbit, that even with the iliac vein open, less resistance is offered by the anastomoses of the arteries than is afforded by the capillaries."

The results of treatment in cases collected by Mr. Cripps may be seen in the following table:—

| Mode of treatment. | Died. | Recovered. | Total. |
|---|---|---|---|
| Ligation of external iliac | 12 | 2 | 14 |
| Amputation[1] | 3 (2) | 3 | 5 |
| Reopening the wound | 7 | 5 | 12 |
| Pressure and bandaging. | 3 | 12 | 15 |
| No treatment | 4 | 3 | 7 |
| Aggregates | 28 | 25 | 53 |

The author terminates his paper with the ensuing conclusions, which we quote in full:—

"It would appear that of these methods of treating secondary hemorrhage from the femoral, ligature of the external iliac is under no circumstances justifiable. The operation is not only useless in arresting bleeding, but exceedingly fatal to the patient's life.

"Amputation has the merit of being recommended by the best authorities in modern surgery, but it would seem that if the patient have sufficient vitality to bear this formidable operation, he cannot be in such a condition as to forbid a further trial of pressure. Still in desperate cases, or those in which gangrene has already set in, removal of the limb may be the only chance of saving the patient's life.

"Opening the wound is a hazardous and uncertain proceeding, and the chances of success appear to be too slight to weigh against the delay, uncertainty, and danger of the operation. Possibly under circumstances mentioned in a preceding page [when bleeding follows soon after the original operation] the operation may be undertaken with a fair chance of success.

"Firm bandaging and the most carefully-adjusted pressure is undoubtedly the treatment to be adopted in these cases, and the method should be carried out with an assiduity and perseverance derived from the firm conviction that in the majority of cases it is the only treatment to be relied upon."

The next paper which demands our attention is *On the Relations of the Histology and Clinical Surgery of Tumours, with an Account of several cases of interest occurring in the Hospital during the past year;* by Henry Trentham Butlin. Mr. Butlin begins his paper with an interesting sketch of what he calls the "rise and progress in the microscopic anatomy of tumours," showing how the battle-ground has gradually changed from simple observation of *microscopic elements* to study of *structure*, and from study of structure to

[1] In one of these cases the external iliac had been previously tied.

investigation of *genetic origin*. We have so often expressed our conviction that the modern methods of classifying morbid growths are not sufficiently definite to be of much use to practical surgeons, that we may be excused from again referring to the subject, particularly as Mr. Butlin seems to us, in the following sentences, to pretty much yield the question in favour of the clinicists. Referring to Dr. Payne's dictum that the modern histologist, when asked if a given tumour is malignant, can only reply that it is of such and such structure, Mr. B. expresses the opinion, in which we quite coincide, that this view of the advantages to be derived from microscopic study is unduly limited, and then adds:—

"But in the majority of cases it is not at all necessary for the surgeon to ask for the minute characters of a tumour, in order to enable him to diagnose the case as innocent or malignant. It may even happen that when the histologist has described what is generally considered to be an innocent structure, the surgeon will be perfectly right in dissenting from the opinion as to its innocence. Ill-defined growths, not encapsuled, or only inclosed in a thin imperfect capsule—growths which affect adjacent structures, as connective tissue, skin, muscle, etc., gradually incorporating them in their continuous increase,—growths of such kinds, which are excessively vascular, require generally no microscopic examination to stamp them as likely to return, and in time to kill. It has become too much the custom to trust implicitly in minute characters for diagnosis and prognosis, even sometimes to the exclusion of general characters which are more than sufficient."

Mr. Butlin's paper is terminated with the record of four cases, one of connective-tissue (fibro-nuclear) tumour, one of spindle-celled sarcoma (recurrent fibroid tumour), one of round-celled sarcoma undergoing calcification, and one of soft carcinoma of the clavicle.

We turn next to an article entitled *Surgical Notes: Wounds and Ulcers;* by GEORGE W. CALLENDER, F.R.S. The information conveyed in Mr. Callender's communication is of rather a desultory character, and his paper is altogether hardly up to the standard which he has established for himself by his former writings. We note, *inter alia*, mention of the use of the aspirator in several cases of strangulated hernia, "but in all instances without being of any service;" a case of fatal hemorrhage from wound of the posterior tibial artery, with lodgment of a foreign body—in which case it seems to us that advantage might have been derived from the employment of Esmarch's bandage; and a fatal case of "litho-nephrotomy," in which, by enlarging a sinus,[1] a calculus weighing eighty grains was removed, though at the autopsy (the patient dying between three and four weeks after the operation) the kidney was found to contain other stones which had not been detected.

The *Treatment of Foreign Bodies in the Vitreous* is the title of a paper contributed by Mr. HENRY POWER, who appends histories of a remarkable case of pterygium, a case of anchyloblepharon, and one of opacification of the cornea without inflammation; these being, moreover, illustrated by means of a well-executed chromo-lithographic plate. In common with most modern authorities, Mr. Power favours early excision of the eye in the majority of cases in which the presence of a foreign body in the vitreous is suspected, and fortifies his position both by the record of his personal experience and by numerous quotations from the writings of other ophthalmologists. The case of anchylo-

[1] The terms "nephrotomy" and "litho-nephrotomy" should, it seems to us, be reserved for cases (such as that recorded by the author in the last volume of the Reports) in which the kidney is formally cut into, and should not be applied to operations which consist merely in the enlargement of previously existing sinuses.

blepharon reported was of congenital origin, and the abnormal adhesions were readily torn through with a slender probe.

Mr. Power's paper is immediately followed by one contributed by his colleague, Mr. Bowater J. Vernon, and entitled *Observations on Iridectomy, with an account of* 118 *cases.* Excluding cases in which the operation has been performed as a preliminary step in the extraction of cataract, this paper embraces an account of all the iridectomies done in the eye-wards of St. Bartholomew's Hospital from the time of their opening in October, 1870, to the end of July, 1874. The whole 118 cases are classified in three divisions, viz.: 47 cases of iridectomy for artificial pupil; 23 of iridectomy for glaucoma; and 48 of iridectomy for iritis and allied conditions, and for the sequelæ of iritis, synechia, etc. For corneal affections Mr. Vernon does not ordinarily recommend iridectomy, though he thinks the operation may be properly tried in some rare cases of progressive ulceration.

*On the Acute Arthritis of Infants* is the title of a paper communicated by Mr. Thomas Smith. Mr. Smith has within a few years observed a number of cases (twenty-one of which he reports in the pages before us) of very acute articular inflammation occurring in young children, and presenting certain peculiarities which he thinks justify him in adding a new disease to the list which surgeons already have to deal with. The affection in question

"probably owes its distinctive features more to the time of life at which it occurs than to any essential difference between it and other recognized joint-affections. It occurs . . . within the first year of life, and is characterized by the suddenness of its onset and the rapidity of its progress and termination, whether the latter be of a fatal or a favourable kind. It is very dangerous to life, and intensely destructive to the articular ends of the bones, which, of course, at this period of life are largely cartilaginous. Lastly, . . . it rarely produces anchylosis, but leaves a child with a limb shortened, by loss of part of the articular end of some bone, and with a weakened, flail-like joint."

The affection does not appear to be in any degree dependent on the existence of a syphilitic taint, and in only two of Mr. Smith's cases was it of traumatic origin. Thirteen of the author's twenty-one cases terminated fatally. The morbid appearances of the affected bones are shown in several wood-cuts.

Though possessing a not very limited experience in the surgical diseases of children, the present writer has not himself observed any cases precisely analogous to those described by Mr. Smith, and is therefore led to believe that the "acute arthritis of infants" is an affection rarely met with in this country.

Mr. Howard Marsh contributes, in the next paper, *Reports illustrating the Surgery of Childhood: Strangulated Hernia, with an Analysis of* 47 *Cases; Umbilical Hernia; Extroversion of the Bladder; Goître.* Mr. Marsh's first case was one of strangulated inguinal hernia occurring in a boy five months of age; herniotomy was performed on the third day of the strangulation, with instant relief to the symptoms, though the child died twelve days subsequently from erysipelas of the scrotum and abdominal parietes. From various sources Mr. M. has collected forty-seven cases of strangulated hernia occurring in children of ages varying from eight days to thirteen years; and from a careful analysis of these cases he shows that the same rule should be observed in dealing with children as with adults, viz., that one "well-ordered and careful trial" should be made to reduce the hernia while the patient is under the influence of an anæsthetic, and that if this trial fail, herniotomy should be at once resorted to.

The second case narrated by Mr. Marsh was one of strangulated umbilical hernia in a child four months old, rupture of the sac occurring spontaneously and leading to the formation of a fecal fistula. Cases reported by other

writers are also referred to, in which the hernial sac consisted of a dilated portion of the umbilical cord. Mr. Marsh's case of extroversion of the bladder occurred in a male child three years old, and the operation, which was done by Wood's method, failed completely, the patient, moreover, dying from exhaustion at the end of seven weeks. Reference is also made to another fatal case, communicated to the author by Mr. Holmes, so that with Mr. Durham's case and the four included in the table published by the present writer in the number of this Journal for April, 1874 (page 422), the number of deaths since the revival of the operation in late years is seen to be at least seven. Mr. Marsh's paper is terminated with a short account of two cases of bronchocele observed in sisters, one a child three years of age and the other less than two.

*On Spontaneous Dislocation of the Femur*, is the title of a paper communicated by Mr. W. MORRANT BAKER. Mr. Baker's patient was a boy four years old, an inmate of the Evelina Hospital for Sick Children. The case had at first been supposed to be one of hip-disease, but upon careful examination no arthritic affection was found to be present, but upward and backward dislocation of the femur existed on both sides. Reduction was readily effected by extension, but when the extension was relaxed the deformity was immediately reproduced. The history of the case showed that the dislocations had followed upon an injury, though after an interval during which the child was apparently well. An effort to keep the bones in place by the use of splints and continuous extension was not very successful, and eight months after admission to hospital the patient died with symptoms of tuberculous meningitis. No autopsy could be obtained. Mr. Baker compares his case with several recorded by Mr. Stanley, and with one communicated to him by Mr. T. Smith, in which an opportunity for *post-mortem* examination was afforded. In the last-mentioned case the ligamentum teres, though retaining its normal attachments, was found to be abnormally long and wide, and so far from preventing dislocation actually tended to push the head of the femur out of the acetabulum. The nature of the deformity in Mr. Baker's case is shown by means of two wood-cuts.

We next turn to a short paper by Mr. E. W. MILNER, *On Two Unusual Forms of Dislocation*. Mr. Milner's first case was one of dislocation of the occipital bone upon the atlas, with fracture of the latter bone and of the axis, and with various other necessarily fatal complications, all produced by a fall from a height of seventy feet. This case is one of much interest, and of a kind very seldom met with, there being, as pointed out by the author, only three other cases of traumatic dislocation of the occipito-atloid joint on record. Mr. Milner's second case was one of dislocation of the head of the femur directly upwards, in which reduction was effected on the sixteenth day by Mr. Savory, a previous attempt made by the same surgeon eleven days before having proved unsuccessful. The appearance of the luxated limb in this case is well shown by means of a lithographic plate.

Mr. ALFRED WILLETT contributes a *Note on some points in Surgery connected with the Patella*, in which, referring to the fact that from the anatomical connection of the patella with the tibia these bones move together, he points out the hinderance which femoro-patellar adhesions must oppose to the cure of knee-joint anchylosis, and suggests as a restorative measure subcutaneous division of the adhesions with a narrow knife, and as a means of prophylaxis an early resort to passive motion. In the latter part of his paper Mr. Willett ingeniously suggests that the splitting fractures met with in the lower articulating extremity of the femur are caused by the application of force to the patella (as by a fall on the knee), the peculiar shape of the bone well adapting it to act as a wedge in splitting off one or both condyles.

In the next paper to which we shall invite attention, Mr. Frederick A. Humphry describes a case of *Excision of the Astragalus and Os Calcis*, the operation having been performed by himself upon a child between nine and ten years of age. The result was in every way satisfactory, and Mr. Humphry's case is quite worthy of being recorded, but surely the editors or somebody ought to have called his attention to the cases published by Wakley, Heyfelder, Teale, and other surgeons, and thus have saved him from the ingenuous remark that "I am not aware that the calcis and astragalus have been both [heretofore] removed."

Mr. John Langton narrates a case of *Large Hydrocele of the Sac of a Femoral Hernia, treated successfully with a Seton and Incision.* Mr. Langton's patient was a woman fifty years old, who for sixteen years had suffered from a femoral hernia, which, during a considerable portion of this time, had been irreducible. About three years, however, before she came under Mr. L.'s observation, the greater part of the hernia was reduced, leaving a small nodular mass, which evidently consisted of omentum, and which by plugging the neck of the sac led to its distension by fluid, constituting the condition known as hydrocele of the part. As repeated tappings only seemed to aggravate the disease, a seton was established by drawing four threads of ligature silk through the lower portion of the sac, and after suppuration had been fully established, the case was treated by making a free incision, which led to a perfect cure. Although hydrocele of the sac is, comparatively, a not very unusual complication in cases of inguinal rupture, it seems to be very rare in connection with femoral hernia: at least Mr. Langton tells us that this was the first instance met with in nearly seven thousand cases of femoral rupture, noted in the records of the Truss Society, during eighteen years.

*Cases in Surgery*, by William Newman, M.D., F.R.C.S., is the title of a short paper which embraces the records of a case of successful excision of the hip for hip-disease, in a man forty-one years of age, and a case of gunshot wound of the knee of twenty-five years' standing, in a man fifty-five years of age, successfully treated by removing the lower half of the patella, which was in a carious condition, and by extracting several small shot which were lodged in the inner condyle of the femur.

*A Case of Syphilitic Disease of the Patella*, by Howard Marsh, forms the last paper of special interest to surgeons. This case occurred in an out-patient, who was kept in a comfortable condition by the continued use of iodide of potassium, and it is recorded merely on account of its comparative rarity.

The volume terminates as usual with the *Statistical Tables of the Patients under Treatment*, during the year 1873, compiled by the Medical Registrar, Dr. W. Ainslie Hollis, and the Surgical Registrars, Messrs. Henry T. Butlin and Edward Milner. These tables are very elaborate, and furnish, in the space of 70 or 80 pages, a large amount of condensed information.

J. A., Jr.

We shall now consider the medical papers in the volume.

The first of these is by Dr. Samuel Gee, and is entitled *Remarks upon Typhoid Fever.* In it the author discusses various subjects connected with the disease, such as the temperature, duration, complications, and methods of treatment; showing us that the habit which is pretty generally diffused of noting the temperature in the mornings and evenings may frequently lead us into error in regard to its variations. Thus in two cases in which hourly observations were made during the whole course of the attack, the minimum occurred on no day at 8 A. M., or the maximum at 6 P. M., hours at which the ther-

mometer is generally used. In his remarks on the treatment of the disease, he quotes the writings of Sydenham and Currie in evidence that they fully understood the importance of moderating the heat of the body, and that they used cold water for this purpose. Among the complications which Dr. Gee discusses are meteorism and ileus. Both of these depend upon a paralytic condition of the muscular coat of the bowel. The latter fortunately is of infrequent occurrence, but the former is sufficiently common, and is, so far as he is aware, very little under the control of remedies. When speaking of the duration of the disease, he takes occasion to express his conviction that true relapses occasionally happen, and are sometimes sub-intrant, by which he means a recurrence of the specific fever before the first attack has fully run its course. In this way he explains the elevations of temperature which are sometimes observed, and which are generally followed by a continuance of the fever just at the time when it would appear defervescence was about to take place.

A communication from Dr. HENRY M. TUCKWELL *On Clotting of the Blood in Gout and Chlorosis*, comes next. In it the author refers to an article by Sir James Paget, published in the second volume of these Reports, in which "attention was drawn to a group of cases in which persons either of gouty constitution, or with gouty inheritance, become the subjects of a certain form of phlebitis, which attacks by preference the veins of the lower limbs." Besides gout, he continues, there are yet other abnormal states of the body, in which the blood is liable to coagulate either in the veins or in the cavities of the heart. One of these is chlorosis. But there is a difference in the manner of coagulation in this condition and in gout. In gout it is, as far as the author's observation goes, the superficial veins which are first obstructed, and nine times out of ten, the veins of the legs. He has once only seen the superficial veins thus affected in the arm of a man, whose family history suggested gout as the cause of the clotting. From the superficial veins the coagulation creeps up toward the larger veins, which become last of all involved. In chlorosis, on the contrary, the clotting will take place haphazard in any vein—in the femoral veins, the cerebral sinuses, or even in the cavities of the heart. He considers, moreover, that in gout the veins themselves are inflamed prior to the coagulation in them, that in chlorosis there is no such preparatory phlebitis recognizable. Hence from this point of view, he says, we should speak of gouty phlebitis and chlorotic thrombosis. The seven cases which he reports, illustrating his views on this subject, possess, we think, unusual interest.

Dr. TUCKWELL is also the author of a paper *On Acute Yellow Atrophy of the Liver in Children*, in which he gives the clinical histories of three cases of the disease, together with the results of the post-mortem examination in two of them. These show that the disease is essentially the same whether it occurs in children or in adults. It appears to be, however, very rare in the former, for it is alluded to in but very few of the leading books on the diseases of infancy and childhood. Dr. West has seen only one case—one of those recorded in this paper. In all the cases the children had been sick for about two weeks with what appeared to be an ordinary attack of jaundice of moderate severity, when alarming symptoms suddenly occurred, death taking place forty-eight hours later. The autopsies revealed the presence of fatty degeneration of the liver, heart, and kidneys, and the author is inclined to believe that a careful examination would have revealed the presence of the same condition in the brain. In two of the cases the liver was distinctly enlarged at the beginning of the attack, so as to reach two fingers' breadth below the arch of the ribs. The author calls special attention to this, believing, as he does, that the atrophy is always preceded by an enlargement.

Dr. Tuckwell discusses at some length the various theories which have been proposed to explain the pathology of this disease, none of which he finds altogether satisfactory, closing by quoting Traube's cautions, saying that "the time is not yet come for the exact solution of this question." He is evidently inclined to place it among the diseases of the nervous system, regarding the lesions of the liver as a part only—and perhaps, as may hereafter be proved, not the most important part—of some general, and as yet little understood, disorder of the body.

Dr. Dyce Duckworth contributes two papers to the volume. In the first of these, entitled *Notes upon some Forms of Hepatic Enlargement*, he considers the following diseases: hypertrophic cirrhosis; lardaceous infiltration; syphilitic affections; enlargement with chronic jaundice; so-called peculiar enlargement with chronic jaundice and xanthelasma; and lastly, enlargements due to influences of residence in tropical climates. He contends that there is a form of cirrhosis of the liver in which the enlargement is not merely primary, but is permanent, and which is more apt to occur in beer than in spirit drinkers. The breath in this form of cirrhosis has a peculiar odour, which it is difficult to describe, but which is never met with in the more usual form of the disease. The author alludes to several cases in which lardaceous livers were observed to undergo a diminution in size after the condition had existed for some time. In regard to a connection between xanthelasma and diseases of the liver, he says the existence of this is by no means proven. Facts are recorded which show that this skin disorder may exist not only in conjunction with chronic jaundice, arising from different sources, but also that it may be present even where there is no manifest hepatic derangement.

Dr. Duckworth's second communication is one of a series of *Clinical Observations upon Certain Skin Diseases*. In this paper he reports an interesting case of Elephantiasis Græcorum, in which the use of Gurjum Balsam both internally and externally was found to be followed by a great improvement in the patient's condition. Among the other cases reported are one of erythema nodosum, occurring in a child aged eighteen months, and one of herpes zoster, occurring in the course of facial neuralgia, and after arsenical treatment. The writer of this notice saw the same complication in two patients who were taking Fowler's solution for some of the consequences of malarial poisoning. The author also makes a few remarks "On the Treatment of Strumous Abscesses by a Carbolized Catgut Seton." The plan he pursues is to transfix the fluctuating tumour with a needle bearing a catgut thread. The latter being drawn through the longest axis of the swelling, the two ends are to be tied together and left, seton fashion, over the abscess. A poultice is next to be applied for two days or more. Usually within forty-eight hours it is found that the abscess has evacuated itself. The special advantages claimed for this method are its simplicity and the almost absolute certainty that no unsightly scar will ensue.

Dr. W. M. Church contributes some *Notes on the Hereditary Character of certain forms of Xanthelasma Palpebrarum;* his observations leading him to the conclusion that the macular form of this disease depends often, if not always, on an hereditary predisposition, and apparently never on derangements of the liver, or on the occurrence of sick headaches, or of dusky pigmentation around the eyes from other causes. He thinks it not unlikely, on the other hand, that the tubercular form may be caused by changes in the vascularity of the parts due either to local irritation or functional derangement of the viscera. It is rather singular, that, in the hereditary as well as in other forms of the disease, females appear to be much more frequently affected than males.

The statistics of a xanthelasmic family who came under the author's obser-

vation, show that of five males who attained the age of forty or upwards, only one was the subject of this disease. The females, on the contrary, who attained a similar age, were twelve in number, and of these no less than five, or nearly one-half, were xanthelasmic, a far larger proportion than is met with in persons of the same age who have suffered with megrim or liver derangement.

Dr. J. WICKHAM LEGG, in an article *On Paroxysmal Hæmaturia*, gives a very fair *resumé* of all that has been written on the subject of this curious disease. While he regards exposures to cold as a frequent exciting cause of the attacks, he has not been able to discover from the records of cases, that the occupations of the patients were, in the majority of instances, such as would render them more than usually liable to such exposures. In about a third of the cases, it is said that the patients had before the onset of the hæmaturia suffered from ague. In another third, nothing is said on this head; and in the remainder, the absence of ague, or exposure to malarious influences, is distinctly affirmed. In a few cases the presence of syphilis has been noted, and in several there is a history of rheumatism or rheumatic pains. Most of the cases come from England; two from Germany, two from France, and one from Russia. Indian physicians are familiar with the disease, which is said to be unknown in Paris, Berlin, and Rome. It would seem also to be common in hot climates, and where malaria is abundant.

Dr. Legg had the opportunity once of examining, microscopically, the urine of a patient suffering from an attack of hæmaturia immediately after it was passed, and had no difficulty in recognizing numerous red blood corpuscles. Next day he examined the same specimen of urine, but failed to detect in it a single corpuscle. He is hence inclined to think that the urine has a solvent action upon the corpuscles, and is disposed to attribute the failure of observers generally to detect them in the urine, to their having allowed too long a time to elapse before making the examination. The urine is almost invariably free from albumen between the paroxysms; but the amount is rather greater than in health, while the urea is slightly below the average. The disease is referred by many physicians to the kidneys, by others it is thought to be of constitutional origin. The author discusses these two theories without announcing his adhesion definitely to either. He recommends antiperiodic doses of quinia to ward off the attacks, and suggests that patients should wear flannel and protect themselves against exposure. A full bibliography is appended.

Mr. NORMAN MOORE contributes *Two Observations on Children*, in which he records: 1st. A case of pityriasis rubra. There was no marked peculiarity in this case of skin disease except the age of the patient, which was only nine years. Devergie asserts that it rarely appears before the age of forty. So far as the author can discover, no other case has been described in a child. 2d. Mr. Moore reports two cases in which cup-shaped depressions in the chest coexisted with enlarged tonsils, and in which the deformity gradually disappeared after the removal of the tonsils. This paper is illustrated by cyrtometrical tracings of the thorax in these cases, both before and after the operation.

Dr. J. WICKHAM LEGG reports several *Cases in Morbid Anatomy;* the most interesting of which is one of Addison's disease. Notwithstanding a most diligent search no supra-renal capsule could be found on the right side, its place being taken by a mass of yellow fat, somewhat tougher than the surrounding fat, into which an artery from the right renal, at its branching from the aorta, could be traced. On the left side there was found a black body, as thin as paper, of the shape of the supra-renal capsule, and near its usual place. Other interesting cases are: 1. Abscess of the left lobe of the liver finding its way into the peri-

cardium and right pleura, and, 2. Hydatids of the liver, omentum, and recto-vesical pouch. Jaundice. Xanthelasma of the tongue, eyelids, and skin.

Dr. T. Lauder Brunton, in introducing the report of two *Cases of Exophthalmic Goitre*, gives a short history of this disease, in which he omits to give due credit to Flajani, of Rome, whose observations antedate those of Parry, Graves, and Basedow. In the first of his cases the prominence of the eyeballs and enlargement of the thyroid gland occurred paroxysmally, being accompaniments of what seem to have been from the description epileptic convulsions. In the second case the disease was complicated by diabetes, a disease which the researches of Cyon, Eckhard, and Pavy have shown to be closely associated with morbid conditions of the third cervical ganglion and of the nerves passing through it, the very part, indeed, to which the nervous disturbances in exophthalmic goitre have been attributed. In this case there was the loss of consensus between the movements of the eyeballs and the upper eyelid on which Graefe laid particular stress, and which was ascribed by him to disturbed innervation of the lids, and especially of the levator of the upper eyelid which is partly supplied by the sympathetic.

Dr. Brunton believes that the palpitations in this disease depend upon irritation of the accelerating nerves of the heart, that the enlargement of the thyroid is owing to dilatation of its vessels, either in consequence of direct paralysis of the vaso-motor nerves or of inhibition of these by others, and that the protrusion of the eyeballs is owing to increased fulness of the bloodvessels in the orbit. The treatment, which he says has given the best results, is the use of digitalis and veratria with galvanism to the neck; the current being made to pass through both sympathetics. Iron he has found to increase the palpitations to such an extent that its employment can rarely be continued.

We shall give Dr. W. Ainslie Hollis's conclusions in regard to *The Therapeutic Action of Vesicants* in his own words.

"We may consider it proved for clinical purposes: 1. That the local action of blisters consists in first diminishing, and subsequently in destroying, the vitality of the parts with which they are brought in contact. 2. That this local action is also depletory. Whilst increasing the amount of blood in the tissues immediately under the blistered surface, it renders the deeper subjacent structures very anæmic. 3. That, besides the depletory action, blisters influence the system generally, depressing the heart's action, slowing the blood-stream, and cooling the temperature of the body. These results are probably due to the reflex action of the central nervous system."

It is more than probable, he adds, that many, if not all, the therapeutic advantages of a blister may be obtained by the application of less powerful epispastics.

Dr. Reginald Southey proposes *Iodic Acid as a Test for Strychnia*, believing it to be much more delicate than the tests in general use, because all these substances, either in solution or in mixture with fluid, possess colour in themselves. Although it is not one single colour, but a play and successive change of colours that signify the presence of strychnia, still a colourless test-solution appeared to him a desideratum. A saturated solution of iodic acid, when warmed in contact with strychnia, evolves an invariable pink-rose tint, which lasts for some little time—an hour or more—and gradually fades out through flesh to a fawn-coloured substance. The author was able to detect, by means of this test, the presence of strychnia in the urine of a dog who had been poisoned by a quarter of a grain injected hypodermically.

Dr. Southey recommends as *A New Test for Opium* a saturated solution of molybdic acid in pure sulphuric acid. The reaction is due to the morphia in

the opium. The best mode of proceeding is to place, by means of a glass rod, a drop of the suspected fluid side by side with a drop of the test-fluid upon either a porcelain slab or a slip of glass laid upon white paper. At once, when the fluids are brought in contact, if morphia or any of its salts be present, a beautiful deep maroon colour will be presented. This colour changes after a while, becoming first deep purple, and then gradually losing its red element, and becoming shortly dark and later a brighter blue, which lasts for several hours, but gradually fades. The reaction is obtained with a single drop of tincture of opium.

Dr. REGINALD SOUTHEY, in addition to the communication just noticed, reports a *Case of Acute Bright's Disease treated by Sulphurous Acid and Vinegar*. The patient was a woman aged 41 years, in whom the symptoms of the disease developed themselves shortly after nursing a severe case of scarlet fever. In consequence of the failure of all the more usual remedies to control the excessive sickness of stomach from which she suffered, Dr. Southey yielded to her craving for horseradish sauce. Finding that this acted well, he then employed the following prescription: Acid. sulphurosi, ℥xx; sp. armorac. comp. ʒj; aquæ destil. ℥j, which was taken every four hours. The active agent in this combination he believes to have been the vinegar, and he has since employed dilute acetic acid in drachm or half-drachm doses with great success in the persistent sickness of the uræmic state. Dr. Southey also attributed very good results to a magnesia mixture possessing diuretic together with slight purgative properties, the formula of which is as follows: Potassæ bitart. ʒj; magnesiæ sulph. ʒj; aquæ menth. pip. ℥j; and to this he added one drachm of the compound spirit of horseradish, which he believes makes it more acceptable to the stomach. The patient made a good recovery, notwithstanding her age.

Dr. T. CLAYE SHAW, at the conclusion of an article *On the Clinical Value of Expression in the Insane*, says:—

"The main thing proved by the insane is, that expressions and gestures may be acquired, which have no correspondence in the sane, and that these gestures are susceptible of a true physiological meaning. That it would be an error to treat them clinically in accordance with the expression; for at times a stimulating line would be pursued when the opposite was really indicated. That they afford the clue to the real mental state in some enthusiasts and ecstatic religionists among the sane. That they give no grounds to conclude that whilst expression of some form may have been at first strictly conservative in obedience to two, at any rate, out of Darwin's three laws, it may not, on the other hand, have been artificially adopted for secret reasons, the fact that special circumstances develop special means of expression being proved by the gesture-language of deaf-mutes."

Dr. JAMES ANDREW contributes the notes of five *Cases of Rheumatic Fever with High Temperature*, four of which were under his own care. "These cases," he says, "were not merely the worst in a severe epidemic of rheumatic fever, differing from the others occurring at the same time in degree rather than in kind. On the contrary, the prevalent type of the disease was, on the whole, a mild one, and these cases stood out in marked contrast to the rest, their high temperature, striking as it was, being by no means their most important character." There was nothing in the history and condition of the patients at all unusual; the only circumstance to which he could attribute any weight was the extreme heat of the summer during which they occurred. He refers to the facts that it is distinctly stated in Dr. Hermann Weber's cases that the temperature of the sick room was excessive, and that Drs. Murchison's and Sanderson's cases also all occurred during the hot months. In the con-

clusions appended to the paper, he says that hyperpyrexia in rheumatism is the effect and not the cause of some nervous lesion; for nervous symptoms identical in kind with those of the hyperpyretic period were observed in all his cases before their rise of temperature took place, and have been observed in cases in which the temperature never reached, even for a short time, any extraordinary height. He thinks it impossible that embolism of some supposed nervous centre can be the cause of the hyperpyrexia. Of all the means of reducing the temperature, he regards the tepid bath as the best. It is free, he says, from the risks attending immersion in cold water, and is vastly superior to the local application of ice, to packing in wet sheets, and to the internal administration of quinia. He does not look upon the existence of pericarditis or pneumonia as a contraindication to the use of the bath.

Dr. James Andrew contributes a second paper, the subject of which is *the Treatment of Rheumatic Fever by a Non-nitrogenous Diet*, in which he gives the results in eight cases of acute rheumatism, the patients being limited to a diet consisting solely of arrow-root biscuits and thin water arrow-root, of which they were allowed to take as much as they liked. In two cases only were any other drugs employed, except blistering fluid to the præcordia when the heart was attacked, opium in moderate doses when the pain was severe, and an occasional purge. This treatment he continued until after the pains had subsided, with the view of diminishing the amount of urea and uric acid in the urine. In his concluding remarks he expresses the belief that the observance of a non-nitrogenous diet promises better results in rheumatic fever than any other treatment. The average time that his cases were under treatment before the pains completely disappeared was 3.75 days—the longest being five, the shortest two days; and in none did any cardiac affection begin or make progress after admission into the hospital. He takes care to add that this treatment is only suited for young patients whose powers of nutrition are yet unbroken. He confesses an error of judgment in having applied it to two of the cases of rheumatism with hyperpyrexia reported in the paper just noticed.

The volume, which we think a valuable one, closes with the Proceedings of the Abernethian Society for the previous year, and with the usual statistical tables, both medical and surgical. J. H. H.

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Art. XXVI.—*Transactions of American State Medical Societies.*

1. *Transactions of the Ninth Annual Meeting of the Medical Association of the State of Missouri.* Held at Jefferson City, Missouri, April 20 and 21, 1875. 8vo. pp. 81. Kansas City, 1875.
2. *Proceedings of the Florida Medical Association.* Sessions of 1874–75. 8vo. pp. 57. Charleston, S. C., 1875.
3. *Proceedings of the Third Annual Session of the Medical Society of Washington Territory.* Held in the City of Seattle, on 22d of October, 1874. 8vo. pp. 34. Olympia, 1875.

1. We notice the adoption by the Missouri State Medical Society of a new by-law concerning the duties of the publication committee. All papers submitted to the committee are to be examined at once, and a report to publish or not to publish made to the Association before the close of its session. Whether or not this decision is final, or liable to be reversed by vote of the Association, we are not told. One or two objections to the new rule may be

found in the hasty manner in which responsible, and, at times, very laborious, duties must be performed, and the consequent debarring of members of the committee from participation in the general employments of the session. So long as the essays to be judged shall be few and brief, these drawbacks may not be serious; but with a large amount of matter they would become very grave. Nevertheless, the mere fact of attention being turned in this direction is a good and hopeful sign. It certainly indicates a desire to discriminate, and is hence worthy of all praise.

The present issue contains two essays concerning *anæsthetics*. The first is a summary of the facts and knowledge of the subject. The other deals with anæsthesia in midwifery. Both writers, Dr. Trader and Dr. Todd, have made some use of the system of circular letters of inquiry, and both must have given much labour and research to their work. The latter, however, is by far the more elaborate paper. It contains a large amount of condensed information as to the frequency of the use of anæsthetics, here and in Europe, by leading obstetricians and authorities, together with the circumstances, methods, and particulars, and the varying opinions and experience derived from books and journals, and especially from two hundred and sixty-two correspondents. The paper is well worthy the attention of gentlemen interested in this important subject.

Cases of *suppurative disease of the middle ear*, followed by cerebral trouble, are reported by Dr. Spencer, with a view to showing the extreme importance of careful treatment at the very beginning of the aural symptoms.

*Laryngeal disease in its relation to pulmonary phthisis* is the subject of an article by Dr. Glasgow. He regards the throat trouble as generally a manifestation of a scrofulous constitution, but not otherwise in any direct necessary connection with phthisis.

2. The pamphlet before us contains the records and proceedings of two annual meetings in January, 1874, and February 1875, of the Florida Medical Association, together with a somewhat elaborate address by the President, Dr. Baldwin, upon the *Climatology of Florida*. Several other papers were read at the meetings upon subjects of much interest. The association is a new one—this being the report of its first sessions. Judging from the matters discussed and the committees appointed, the organization begins with high aims and in a good spirit. We wish the new society the highest success in its efforts to elevate our profession and to benefit the public.

The article upon the climate of the State seems to exhibit considerable acquaintance with meteorological science. As to the soundness of the author's views and inferences regarding the laws of storms, and the propriety with which they are here applied to explain local phenomena, we are wholly unable to judge. Some statements as to more familiar matters, however, tend to inspire a little distrust. Thus we are told [page 25] "the variation of the distance of the sun from the earth, however, produces no effect on the different seasons, as many suppose, *since the rapidity of motion or the shorter duration of proximity to the sun just compensates for the greater intensity of the sun's rays*, due to the near approach." To say the least of it, such a mode of expression is vague, unscientific, and adapted to mislead. Again we read, just below, that, "owing to the spherical form of the earth, the sun's rays strike it *obliquely at all places, except those over which the sun is vertical*, and where his rays are perpendicular, and it is these *vertical rays alone that produce results*." Hard doctrine to believe in the latitude of Philadelphia in these sweltering July days: we are sure there are no vertical rays, but we have thought that

such as struck us were not wholly devoid of results! The same faulty expression is repeated where he speaks of the "sum of all the vertical rays" of the sun "received on any parallel of latitude." Of course no parallel outside the tropics receives any such rays, and no point anywhere receives such, except for an instant, twice yearly. We do not for a moment believe that our writer's ideas are as inexact or incorrect as such phrases would indicate. He may very probably have a very clear and correct knowledge of his subject. But surely it is not unreasonable to expect of a scientific writer some attention to exactness and accuracy of language, especially when dealing with a new and difficult science. If we seem to lay undue stress upon a few unfortunate expressions, our excuse must be a sense of disappointment at being forced to mistrust in any degree an apparently able and very laborious paper upon a subject of the greatest interest. It is only just, also, to add that some other portions of the essay seem to us to be characterized by clearness and accuracy, while the whole of it is readable and attractive.

3. This modest pamphlet contains the records of the third yearly session of the Medical Society of Washington Territory. To organize, and to hold regular meetings in a region so new, thinly populated, and but poorly provided with railroads, is creditable to the profession.

A case of *Tetanic Symptoms following Cranial Fracture*, successfully treated by heroic doses of hydrate of chloral, is reported by Dr. A. H. Steele. There was depression of a semilunar fragment, some five inches by two and a half, involving the posterior and superior portion of both parietal bones. Dura mater pressed, but not stated to be wounded; considerable hemorrhage from both ears, and vomiting shortly after injury. Patient very restless, though semi-comatose, requiring two men to keep him in bed. Pupils natural, skin cool, and ashy-hued; pulse 48, and regular. Attempts to elevate bone through the scalp-wound, failing at the place of accident, the patient was removed by open boat and steamer to the nearest town, getting wet on the passage. Here the depressed bone was raised, twenty-six hours after injury. Hebetude diminished, and pulse came up six or eight beats. At 6 P. M., some four hours later, pulse was 58; restlessness very great; opisthotonos evident in neck, trunk, and legs, with great stiffness of jaw muscles. Fifteen grains of chloral, twice exhibited, having little effect, thirty were soon given, with some relief, and continued every two hours. Patient got some sleep, and was much more quiet. Pulse at 6 A. M. 68. Rigidity not much changed. Chloral ordered only four hours; broth enema. Slept most of day, but became restless again at night. Next day had milk-punch, beef-tea, and enema of castor-oil; pulse 72; chloral less frequently given. The following day ten grains of bromide of potassium every two hours, was ordered. Five days later, pulse 66; temperature 96; urine abundant, involuntary, sp. grav. 1001 [?]. Discharge of blood and pus from both ears had been constant. Hearing somewhat impaired, but improving. Much more quiet. Next day, or eleven after accident, tried to walk, but staggered, and involuntarily *moved backward*. By a determined effort, however, he succeeded in going forward in a zigzag manner. Pulse and temperature unchanged—66 and 96°; urine as previously. Under frequent cathartics, and the bromide in diminishing doses, continued gradually to improve, though with slight mental dulness, and some retinal congestion. Eight weeks after injury, reported himself ready to resume work. Functions were regularly performed, and he seemed in fair health. There was, however, some lack of activity and warmth in the left limbs. At date of report, six months after wound, was working as brakeman. In the

first twelve hours 180 grains of chloral were exhibited, and the same amount again in the following twenty-four hours. The influence of the drug was marked, and is believed to have prevented the full development of tetanus.

A non-united fracture of the leg, successfully treated by Brainard's operation, is reported by Dr. Wanghop.

The most striking feature of this publication is its terrible indictment of the Territorial authorities for the shameful provision made for their insane. This comes from no less responsible a source than the resident physician of the asylum, who, after reading his statement, placed the resignation of his office in the hands of a committee appointed by the Association to confer with the Governor, and to urge a thorough investigation. A resolution was also passed, sustaining Dr. Willison's views and his course; and affirming that personal self-respect and professional dignity alike forbade a physician to continue in the position to which existing regulations of the asylum would degrade him.

The patients are "farmed out" to the lowest bidder—delivered over to the tender mercies of a "contractor," who takes them as he would a bridge or paving contract, to make all he can on the job. To this man the physician is subordinate, having absolutely no function or authority beyond prescribing. Thus the supreme control, instead of being lodged in the hands of an educated medical man, whose professional spirit and pride, as well as his interest, all prompt him to such measures as shall promote cure, and secure quiet, order, comfort, and contentment, is vested in a man of a class notoriously dead to all motives but the love of gain, and whose interest bids him keep patients, and not to cure them. He only, hires and discharges attendants, provides food, clothing, and service. To expect from him any expenditure of money or labour to promote cheerfulness or improvement would be the height of absurdity. Now, how Dr. Willison can speak in the calm and temperate way he does about the results of such management we can scarcely comprehend. Not a day can have passed without bringing before his eyes instances of lost chances of recovery, shamefully improper treatment, cruel neglect of means to cheer the sad and relieve the suffering, and a general heartlessness of management more suggestive of a dog-pound than of a hospital. But with remarkable self-control he calmly points out the necessary results and workings of the system, rather than dwells upon individual instances such as must have made his blood boil time and again.

Upon the "sanitary, hygienic, dietetic, or moral management," Dr. W. tells us the physician "has no voice." Over the attendants, on whom so largely depend the welfare of patients and the success of treatment, he has no control whatever. "An ignorant, inexperienced person, formerly an ordinary farm labourer" .... "has authority over both male and female patients, with absolute authority to lock up, or put in irons, or use any manner of restraint that his brutal fancy may suggest, to punish patients who do not conform to his crude ideas of proper deportment." In the interest of economy, a partition between the two male wards was torn down, thereby destroying the only opportunity for classifying patients, in order to save the wages of one attendant. Dr. Willison's earnest appeal for the preservation of his only means for separating the quiet, decent, and convalescent classes from those which are noisy, quarrelsome, or repulsive in habits, was "treated with silent contempt." Just fancy the results of placing patients recently attacked, not utterly maniacal or demented, and accustomed to the decencies and proprieties of life, in close, constant, and unavoidable contact with such a heterogeneous mass of degraded misery

The system of attendance upon the female patients is simply shameful and horrible. A "matron" is supposed to exercise a general supervision over them, to see that they are dressed in the morning, and sent to bed at night. If, however, any woman-patient becomes "refractory" at any time, she is turned over to the male attendants to "handle." With the implied assurance that his suppositions are perfectly liable to become actual facts, Dr. W. pictures to us a tender, refined young girl, idolized by her parents, sent to the hospital as the surest means of cure, and there "entrusted to the care of coarse, ignorant male attendants . . ." "recruited from the ranks of second-class restaurant waiters or discharged sailors" . . . "stripped of her clothing, and, in a perfectly nude state, put into the bath-tub by rough, uncouth men." Can it be possible that people of the same country and the same race that in nearly every State have provided so nobly for its afflicted members, can for another day tolerate such brutishness?

The diet of the patients is prepared by a Chinese cook, with help from patients, without any regard to the views and desires of the physician.

Knowing the governing principles of the asylum, we can readily believe the Doctor's statement that the benefits of out-door labour are extended to patients with reference to the profit of the contractor rather than that of the workers. Not those who need work most, but those who will accomplish most, and give least trouble to the overseer, are taken out.

It is passing strange that in this age and country, argument should be needed to show that the best and most enlightened treatment of insanity is the truest economy to the State. But the narrow and mistaken policy of this Territory would seem thus to indicate. Accordingly, Dr. Willison quotes largely from the best authorities to prove the financial gains resulting from the earliest, most universal, and most skilful treatment of her insane by each and every State.

The protest is earnest and manly. The positions taken as to the real needs of the insane, and the best ways to meet them, are sound and just. We most fervently hope that this paper, emphasized by its writer's resignation, and backed by the committee of the Society, and the influence of its Fellows, may awaken public sentiment to a sense of the sin, shame, and impolicy of existing arrangements. B. L. R.

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Art. XXVII.—*Reports of American Hospitals for the Insane.*

1. *Fifty-eighth Annual Report on the State of the Asylum for the Relief of Persons deprived of the Use of their Reason.* 8vo. pp. 34. Philadelphia, 1875.
2. *Thirty-second Annual Report of the Managers of the State Lunatic Asylum, Utica, New York, for the year* 1874. 8vo. pp. 74. Albany, 1875.
3. *Annual Report of the New York City Asylum for the Insane, for* 1874.

1. Having so recently noticed at some length the improved means of usefulness now possessed by the *Frankford Asylum*, we need only commend, in passing, the humane and sensible views upon treatment here presented by Dr. Worthington.

Reading the acknowledgment of a weekly gift of flowers, placed in the wards by a manager, we are reminded that we have read, heard, or dreamed of managers who transported flowers in the opposite direction; of green-

houses, hot-houses, aye, and gardens, whose produce was deemed much too choice to be wasted upon miserable lunatics, but was preserved with jealous care for appreciative weekly visitors. Surely this coveting of solitary ewe-lambs must occur only in distant lands; surely not in this country—or city! But it will do no harm to pray that our helpless, mind-beclouded brethren may find a few more managers and neighbours like the large-hearted Friend at Frankford.

Bequests of $5000 and $1000, with a gift yielding $518 yearly for the help of needy patients, are acknowledged. The last is from a generous lover of his fellow-men, who prefers to deal out alike his smaller benefactions and his munificent endowments with his warm, living hand. Long may he live to enjoy the blessedness of giving, and to provide a much-needed example to men of wealth, to show the superiority of living charity over posthumous beneficence!

2. The awful responsibility, often lightly assumed, attaching to those persons who remove from hospital restraints patients known or suspected to be dangerous, is the text for some earnest and judicious remarks by Dr. Gray, of the Utica Asylum, in the report before us. Three sad cases from the last year's experience are mentioned in illustration. Two committed suicide immediately on being set at large. The other patient delayed taking her own life long enough to attempt by poison to destroy her son and her husband. Every medical man who has been connected with insane hospitals will recognize the reality and frequency of proceedings such as Dr. Gray deplores. The superintendent is informed by visiting friends that they have concluded to take home their insane relative. If he or she happen to be of homicidal or suicidal tendencies, or possessed with delusion likely at any time to break out into terrible violence, and the physician remind them of past experience, or explain his reasons for future apprehension, it often makes no impression whatever. They "guess they can look close after him," or think "he wouldn't hurt the folks round home," or opine that the "change will do him good." The most solemn warnings are as ineffective against their purpose as Dame Partington's broom against the Atlantic Ocean. Frightful risks are taken with an ignorant self-confidence that is amazing. It certainly seems as if legislation ought to protect society from the terrible dangers of presumptuous ignorance and reckless selfishness, as displayed in this manner.

Interesting historical notes are presented of the steps by which the pathological investigations of this asylum have attained to their present excellence of method. The microscope and photography together are now doing wonders for the pathology of insanity; and Utica may well be proud of her pre-eminence in the use of the new facilities.

3. Dr. Macdonald, the writer of the Report of the *New York City Asylum for the Insane*, has held his present superintendency only since August, 1874. It is obvious that he has entered upon his work with a desire and intention to correct abuses and make improvements. We heartily wish him success; but knowledge of the experience of other good and earnest men, who have tried to do their duty in municipal institutions, almost forbids hope. It is true he has already made some important reforms; so we will fervently hope that he may be allowed to maintain these and add others.

A vicious system of furloughs, almost uniformly hurtful to patients in such circumstances of poverty and degradation as surround the homes of this class, has been done away with. The employment of degraded women, from the penal institutions, to do the ward work, has also been discontinued. The Dr.

found these lowest and vilest of women "in constant and close contact with patients and attendants." During the few days this was allowed to continue, he saw abundant evidence of the degrading influences produced by the revolting behaviour of these women. Their banishment met with opposition from the attendants; which fact shows the wretched material for attendants provided by New York politicians.

Here again we find an earnest protest, on both humane and economical grounds, against too great parsimony. With better diet and better general provision, Dr. Macdonald believes many men now life-inmates would have been well and self-supporting. He says plainly that his own patients receive food insufficient in quantity and of too limited a variety. Of course, the wards are over-crowded, in the proportion of 673 to space intended for 423.

Dr. Macdonald urges the enforcement of a law, already on the statute-book, designed to prevent unprincipled persons from pauperizing their insane relatives for the purpose of preserving the estates of the latter for the present or future benefit of the former. For the credit of human nature, we are glad to see that the Dr. claims present knowledge of but two such cases in his charge, though he believes there are many more.

Carelessness on the part of authorities who should be vigilant, leads to the imposition upon New York of much pauperism that should be supported elsewhere.

Giving due credit to a kind and faithful few, Dr. Macdonald complains of the low *morale* of the majority of his attendants. Deliberate cruelty, and intoxication, have been overlooked, or the culprit has been allowed to resign, and then been re-appointed. From this charge it is obvious that the physician has not, at the least, full control of his attendants. Nothing but evil, and evil continually, can result to a hospital and its patients from a want of power on the part of the medical management to dismiss and appoint attendants. That good attendants, once secured, should be well fed, allowed time for recreation, and means of enjoyment, is good counsel. The Dr. is afraid, and no wonder, to recommend higher wages, lest he "tempt a class of political hangers-on to take the places" in which to shirk work and draw pay. How significant is this caution!

The condition of the State lunacy laws does not seem to be very happy. In fact it is decidedly muddled. For instance, a patient is placed in a hospital on the required certificate of two physicians, under oath. Now this certificate must be "approved" by a judge or justice before five days pass, else the patient must be discharged. But the judicial officer may "institute inquiry and take proofs as to any alleged lunacy before approving or disapproving of said certificate," and may "in his discretion call a jury in each case to determine the question of lunacy." Now inquiries, taking proof, and especially jury trials, take time and cost money. If his certificate be not approved nor disapproved in five days, what becomes of the patient? Does he go at large on bail, or wholly free, or is he taken from court to the Tombs every evening? The hospital cannot hold him, according to this provision. Taking into account the low character of the mental and moral endowments of the minor judicial officers, we fear it will be easy for impertinent meddlers to deprive a sick man of his best chance of recovery by rendering his hospital commitment practically impossible.

Again, the law concerning certificates has been so tinkered and so involved in obscurity that there is reason to believe that some 150 patients have been illegally committed, and are consequently illegally held, in this asylum!

Moreover, from the peculiar phraseology of one article, the public have

wrongly believed that only a few examiners, appointed by the State, were competent to give certificates, instead of all regular physicians of established residence, good character, and three years of practice. This idea, first derived from a suggested law which did not pass, has been cunningly fostered by a certain clique of medical men who have actually issued circulars conveying the impression that they, and only they, are the proper legal givers of certificates.

Dr. Macdonald complains of the inane and ridiculous attempts made by signers to give their reasons for belief in the insanity of their patients. Scores of these are quoted; and they are literally incredibly inappropriate, impertinent, and absurd. They preach the most powerful sermon we have yet met with upon the need of common sense and general culture as a preliminary qualification to the study of medicine. Anything so illogical, so stupid, and so vulgarly ignorant, as are many of these responses, we could never have imagined as coming from graduates in medicine.

The whole impression made by this report is a sad one. The suffering poor ill cared for, and abused, and subordinated to the avarice and ambition of low politicians; an earnest and humane physician seeing abuses and wrongs which he is not free to set right; popular prejudice standing between the sick and the means of cure; and lamentable folly where good sense might be expected.

B. L. R.

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ART. XXVIII.—*Manual of Pathological Anatomy.* By C. HANDFIELD JONES, M. B. Cantab. F.R.S., Physician to and Lecturer on Clinical Medicine at St. Mary's Hospital, etc., and EDWARD H. SIEVEKING, M.D., F.R.C.P., Physician to St. Mary's and the Lock Hospitals, Physician Extraordinary to the Queen, etc. Second edition, revised, enlarged, and edited, by JOSEPH FRANK PAYNE, M.B. Oxon., Assistant Physician to and late Demonstrator of Morbid Anatomy at St. Thomas's Hospital. Crown 8vo., pp. xii., 871. London: J. & A. Churchill, 1875.

THE first edition of this manual appeared in 1854. The absence of any work in the English language, embracing the whole subject, was offered as the incentive and the apology for an attempt to lay before the profession an outline of what was then known in the domain of pathological anatomy. The experience, attainments, and position of the writers were such as amply to attest their fitness for the task, and the able manner in which it was performed may be judged from the kind reception and appreciation which it met with and the position it assumed and has since maintained as a text-book.

Between the first and the second editions, twenty years have elapsed—twenty years of an age distinguished by a desire for positive results, and a thirst for exact knowledge that have stimulated inquiry and original investigation in every department of natural science. During this period, pathology has profited by investigation perhaps more largely, and has thus made more substantial progress than any other department of medical science. By the aid of the microscope, organic chemistry, spectrum analysis, and the most ingenious apparatus and experiments, diligent and skilful observers have so well improved their opportunities for research, that the directions in which their advance is checked only by want of knowledge of physiological conditions are steadily increasing in number. However correctly, therefore, a book might represent the state of pathological anatomy twenty years ago, it would require

many alterations, additions, and omissions, and the most careful revision to make it at the present day as timely and appropriate.

Dr. Payne, to whom the task of editing the second edition has been entrusted, has in the main succeeded in the work of making it conform to the present state of our knowledge of facts, while he wisely refuses, in such a work, to discuss many mooted theoretical points. He has well engrafted the later views, for instance, in the chapter on turbercle and tumours, upon the older text, but is often sadly cramped by it. His reverence for it is so great that he reproduces it to the greatest possible extent. The oft-recurring "of late," "recently," and other similar expressions, are reproduced verbatim from the first edition, when referring to certain pathological discoveries which were recent twenty years ago, but can scarcely be called such at the present time. The style too, while in general smooth and clear, is occasionally marred by slovenly or inexact expressions, as on page 394, where he speaks of phlegmasia dolens, "in which the femoral and iliac *veins* are coagulated." Such a vein would indeed be a pathological phenomenon. Indeed, so difficult is the task of editing an old book on a progressive science that we cannot avoid the conclusion that it is generally better to rewrite it, that is to say, write a new book, and we think this book is no exception to the rule.

The first seven chapters, about one-fourth of the book, are devoted to general pathology, comprising morbid states of the blood, inflammation, textural changes, new formations, tubercle and its allies, and parasites. The tubercular crasis is dropped from the blood disorders, and the subject of tubercle is properly dignified by devoting to its consideration a separate chapter. The following admirable summing up will give a good idea of the clear manner in which this subject is discussed:—

"Tuberculosis is generally, if not always, a secondary disease following some local inflammatory affection; but while several processes, such as induration, suppuration, caseation of inflammatory products, often occur, the conditions under which this secondary affection follows are, at present, unknown; since it is quite certain that all the lesions described as the precursors of general tuberculosis may occur without the development of this disease. The question is equally unsolved whether the infective substance in the tubercle (elaborated within the body or introduced from without) is something *specific*, or whether the effects it is supposed to produce are dependent on mere mechanical irritation and obstruction of vessels."

Although the observations of Chauveau, Klebs, and others upon the production of phthisis in animals by feeding them upon tuberculous matter are referred to, no mention is made of the possibility of the transmission of tubercle by milk which has been demonstrated by the conclusive experiments of Klebs, Gerlach, and Bollinger, in which intestinal and subsequently general tuberculosis was caused in dogs and other animals when fed upon the milk of infected cows, an important practical fact in view of the alarming rate of infant mortality in cities where the children of the poor are generally fed upon swill milk, and in relation to the suckling of children by mothers already the victims of the disease.

In the department of special pathology we miss many important subjects. Thus, no reference is made to the degeneration of the muscular structures of the heart, and the general muscular system in fevers. Laennec insisted upon the occurrence of cardiac softening after essential fevers of the typhus type, and the more recent and careful researches of Hoffman, and Zenker, have demonstrated that it occurs with great uniformity in such cases, not only in the heart but in many other muscles, especially those most frequently used.

The lesions of cerebro-spinal fever deserve more than the passing notice they

receive under the head of simple meningitis, and should certainly appear in the index. The condition of the mucous lining of the stomach in yellow fever considered almost characteristic, by Da Costa and others, seems also to have been neglected, and no mention even is made of the so-called "ovarian cell" asserted by Drysdale and Atlee to be pathognomonic of cystic disease of the ovary.

Thrombosis and embolism with all their varied results are well discussed in a succinct and valuable chapter, though we object to the word "blocks" as an equivalent for the definite term "emboli."

The surgeon will be disappointed in looking for many subjects of interest in surgical pathology. The subject of air in the veins is considered, but no notice is taken of the experiments and observations of Feltz and Robin, which show its danger to lie not in the absence of cardiac stimulation by the air, but in the obstruction to the pulmonary circulation by aerial emboli. Phosphorus necrosis of the jaw is barely alluded to in a line, and no mention is made of the general fatty degeneration of the muscles in phosphorus poisoning. The consideration of abscess occupies but a page, and neither here nor in the chapter on the bones is any mention made of the abscesses which occur in the interior of the bones. Not a word is said as to the repair of bones after fracture, nor is there a line devoted to either the eye or the ear—the eye especially a great omission.

The numerous illustrations are mainly those of the first edition. Some have been added and a few omitted. Very many of those retained could be advantageously spared and give place to others; for instance, in the chapters on inflammation, and necrosis, and illustrating the trichina. Many of those which attempt to depict gross ocular appearances are absolute failures. The "Section of [a] muscular tumour of [the] uterus" (Fig. 23) or the "Drawing of [an] atrophied kidney" (Fig 160) are scarcely more intelligible than the one on page 521, which might pass for a representation of a piece of anthracite coal, though labelled "Straw-coloured lymph coating an inflamed lung."

The good points and general attractiveness of the work, however, far outweigh these and many other minor objections which could be named. That it will continue to be a favourite text-book, especially in England, we cannot doubt, and it will deserve to be such until some completer work shall appear which will do, on a comprehensive scale, what the excellent little work of Green has done in its more modest though not less useful way. W. W. K.

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ART. XXIX.—*The Goulstonian Lectures on Puerperal Fever. Delivered at the Royal College of Physicians, London.* By ROBERT J. LEE, M.D., F.R.C.P., Assist. Phys. to the Hospital for Sick Children, Great Ormond St., etc. 8vo. pp. 53. London: Smith, Elder & Co., 1875.

IN these three lectures, we have presented a condensed summary of the history, epidemical characters, presumed producing causes, and modes of treatment of this interesting and often fearfully fatal disease, which was well described even as long back as the day of Hippocrates, by whom some characteristic cases were reported, and who also refers to the prevalence of erysipelas at the same time, no doubt believing, as we do at the present day, that the two diseases were intimately associated, but not perhaps understanding the oneness of their pathological characters, especially when of an epidemic and malignant type.

Dr. Lee examines into the views of Harvey, Mauriceau, Cullen, Hulme, Doulcet, etc., to show what were the standard opinions of the seventeenth century upon the subjects of poison, miasma, or contagion in the production and transmission of disease. He gives to Dr. Alexander Gordon, of Aberdeen, the credit of having first published to the world the theory of specific contagion in puerperal fever, and contrasts his claims for priority, with those of Denman of England, and Semmelweiss of Germany, to the unquestioned establishment of that of the first-named author, whose views resulted from observations made during an outbreak of the fever in Aberdeen, continuing from 1789 to 1792.

The third lecture is almost entirely devoted to an elucidation of what might be called the *bacterial theory of the conveyance of disease*, *i.e.*, the dependence of the influence generally known as *contagion* upon the existence, in the diseased tissues, of myriads of microscopic organisms known as "bacteria," "micrococci," etc., which it is held by some observers are the media of conveyance of a variety of maladies, each special form having perhaps its own peculiar animalcule or vibrion. Practically, this idea is as yet of little value, as the subject still requires a great deal of close investigation to give it general credence. The views of Heiberg, Virchow, Lister, Billroth, and others are of considerable interest to the student of pathology; but there are irreconcilable points as yet, which it would seem must either be explained, or there must be admitted two orders of the same disease, one dependent upon the existence of minute organisms, and the other originating and being developed without any trace of them being discoverable. Prof. Heiberg discovered bacteria in the lacunæ of the nasal mucous membrane; and the reviewer recently accounted for the existence of a large number of cases of puerperal fever in the practice of an accoucheur, by the fact that he was all the time the subject of ozæna. Is there any special connection between the diseases as based upon one and the same species of bacteria; or is it that the organic form is simply associated with a disease—conveying purulent discharge?

But seven of the fifty-three pages are devoted to the treatment of this formidable disease; and in these, there is little of any positive value that was not known at the time of Cullen, who recommended hygienic, evacuative, and diluent treatment, based upon the idea of septic or putrefactive infection and accumulation. It is true, that, in a general way, an anti-bacterial medication and disinfection, founded upon experiments made under the microscope, is recommended; but no clinical cases are quoted to show the value of such a system, which is still hidden in the mist of theory. Unfortunately, the disinfectants found fatal to the organisms referred to, or capable of preventing their development, cannot be introduced into the human system in quantities sufficient to act as they may be seen to do upon the microscopic slide; and we are obliged to restrict their employment to extraneous infected matters, such as the morbid discharges from the uterus, vagina, bowels, etc. Preventive expedients founded upon the belief in the possibility of the conveyance of puerperal fever, have done much to diminish the frequency of the disease, particularly in such hospitals as the Dublin Rotunda; but curative measures in severe cases are such only in theory in a large proportion of them, and it is now a matter of question, whether the depletory treatment judiciously employed would not be quite as successful as the systems substituted for it. The most severe case to recover, that the reviewer ever saw, was under a venesection of ʒlvj. R. P. H.

ART. XXX.—*Maternal Impressions: A Consideration of the Effect of Mental Disturbance during Pregnancy, upon the Intellectual Development of the Child.* By ROBERT J. LEE, M.A., M.D., F.R.C.P. pp. 15. London: 1875.

AN extract from the preface will explain the design of the author.

"The chief point of interest is the connection between impressions strictly mental, and deficient development of the intellect of the child born under the circumstances referred to. This view is different from that which attempts to connect deformities or marks in children, with the sensible qualities of the object which frightened the mother. It is not surprising that we receive stories of this kind somewhat skeptically. It may be observed that the mental condition of these children is similar to that which is produced in healthy children by actual fright. The general health is usually very good indeed; and though the power of speech is deficient and the intelligence is small, and the passions are easily excited, yet to the impressions of sound, particularly of music, they are extremely sensitive."

"It would, on reflection, appear to be most natural that maternal impressions should be more frequently followed by some unnatural condition of the intellect of the child, than by abnormalities of growth." . . . . "To confirm our expectation, we find by experience that it is true." (p. 12.)

The writer states that numerous cases of mental abnormality have come under his notice; that they have almost always been attributed by the mothers to mental disturbance during pregnancy; and that the ratio of cases of intellectual abnormality to those of marked malformation are in his opinion as nine to one.

Although the fœtus in utero has no direct nerve connections with the mother, experience teaches us that mental impressions, especially those produced by anxiety and fear, have a marked influence upon the uterus and its contents. Many sensitive women have been made to abort by causes of a very trifling nature, producing sudden shock. A patient of the reviewer, in very robust health, aborted from the falling of a caterpillar from a tree upon her bare head; and at another time by being told, in the street, that there were several worms upon her dress. She was conscious of an immediate nerve thrill through her system, and a determination towards the uterus ending in labour pain. Passion, we know, is capable of rendering the milk of a woman poisonous to her infant, so as to cause convulsions and death; then why may not the blood, from which the fœtus in utero derives its nutrition, be so changed by the shock of fright, as to be capable of deranging the cerebral development of the said fœtus, as we know the same impression is capable of doing directly, in a young child? There are points of very mysterious interest connected with the whole subject of intra-uterine developments which can never be solved. It would seem that the mother ought to possess a greater influence over the child developed within her, than the father; but unless it be by some nerve shock, the determination of size, form, resemblance, mental vigour, tastes, physical health, etc., appears very nearly equally divided between them. There seems to be a strong connection between likeness and the predisposition to disease, but in some instances the former is just as marked for the sound parent as the latter is for the unhealthy.

Dr. Lee reports four cases of mental deficiency in children born of mothers who had been the subjects of mental disturbance during gestation. One from fright produced by a woman attempting to stab her three months prior to parturition. Another from mental anxiety caused by her husband's illness. A third from fatigue and anxiety in consequence of a sister's insanity. And the

fourth from fright produced by seeing one man stab another in a tavern, four months before parturition.

Other cases noticed were attributed to a thunder-storm; seeing a child run over; violent hæmoptysis in husband; escape from being blown from a railroad bridge, etc. Fright appears by far the most common exciting cause.

R. P. H.

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ART. XXXI.—*Sur un nouveau Procédé opératoire de la Cataracte (Extraction a lambeau périphérique)*. Par L. DE WECKER. 4to. pp. 4. Paris, 1875.

DR. WECKER, like all others who have had large experience in the various methods now in vogue for the extraction of cataract, has encountered a considerable number of losses and of partial successes, and commences his paper by an estimate of the percentage of each, in the old flap operation of Daviel, and in the peripheric linear method of Graefe. He estimates the immediate absolute losses by the former method at ten per cent., and places at the same figure the number of those who must submit to a second operation.

The linear operation, by insuring a better coaptation and more rapid cicatrization, gives five per cent. of immediate loss, and five per cent. of cases requiring secondary operations. He rejects all methods by which a linear incision is made in the cornea (Le Brun, Liebreich), on account of the frequency of prolapse of the iris, and the formation of anterior synechia, and proposes to operate as follows:—

1. While the assistant raises the upper lid either by his fingers or a small elevator, the operator fixes the eye with a pair of forceps, seizing it at the middle of the internal border of the cornea, and with a suitable knife (figured in text), detaches accurately the upper third of the cornea from its junction with the sclerotic. A flap is thus formed (on a cornea with a diameter of 12 mm.), with a base of 11.32 mm., and a height of 4 mm. As soon as the counter puncture is made, and it becomes impossible for the iris to fall forward on the cutting edge of the knife, the operator lays aside the forceps, and terminates the section without making any conjunctival flap. The upper lid is then released and the eye closed.

2. The closed eye is covered with a cold sponge, and the patient allowed a short rest. The operator then uses an ordinary cystitome to open the capsule, while with the other hand he himself holds up the upper lid.

3. While the assistant again raises the upper lid, the operator pushes the lens towards the incision by means of the finger on the lower lid, and at the same time with a thin rubber spatula depresses the upper lip of the wound, and the "*peripheral insertion*" of the iris, so as to disengage the lens, which at the moment of exit is apt to be covered by the iris.

4. The pupil is cleared of all cortical masses by pressure on the cornea from below upwards with the finger, protected by the lower lid, and until it is perfectly clear, no attention is paid to any prolapse of the iris, which, if it does not retract of itself, is gently replaced in the anterior chamber by means of the spatula.

5. When the prolapse has been replaced in the anterior chamber, two to three drops of a neutral (½ per cent.) solution of the sulphate of eserine is dropped into the conjunctival sac, and a pause is made of five minutes to allow the myotic action of the drug to manifest itself. Then if no prolapse is

visible when the patient looks down, a compressive bandage is applied, which is removed two hours subsequently, to allow a second application of the sulphate of eserine. A considerable myosis is thus obtained, which lasts longer than the twenty-four hours usually required for closure of the wound. Wecker states that no irritation is caused by a fresh neutral solution of sulphate of eserine, but gives no statistics of the results obtained by this method.

W. F. N.

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ART. XXXII.—*Clinique Ophthalmologique du Dr. de Wecker.* Par Dr. MASSELON, Chef du Clinique. 8vo. pp. 32. Paris, 1874.

THESE statistics of operations at the clinic of Dr. Wecker show a total of 670 operations for the year 1874, and the writer considers it necessary to apologize for their limited number by stating that during five months Dr. Wecker was absent from his clinic on account of sickness. Of this series 204 were operations for cataract, and of these 179 were senile cataract, operated by the peripheric linear method. Of the latter eleven (6 per cent.) have been lost sight of, so that there remain 168 to be accounted for. Of this number (viz., 168), 156, or 92.85 per cent., recovered with vision, varying from $\frac{1}{1}$—$\frac{1}{10}$; 3 (or 1.19 per cent.) lost their eyes from suppuration of the cornea, and 9 (5.35 per cent.) had closure of the pupil.

Among 135 iridectomies, we find 39 for optical and 96 for antiphlogistic purposes. Of the latter only 1 for acute glaucoma, 31 for glaucoma simplex, 6 for chronic inflammatory glaucoma, and 24 for irido-keratitis. We find 16 iridotomies, of which 2 were for congenital luxation of the lens, and 1 for zonular cataract.

In one of the former the slit in the iris was made inwards and downwards (the luxation being upwards and outwards), with great success. Before the operation there was a myopia $\frac{1}{3\frac{1}{4}}$, with an acuity of vision $\frac{1}{4}$. After obtaining a clear pupil below the lens with $+\frac{1}{28}$, $V$ in right eye was $\frac{1}{2}$, and in left eye $\frac{1}{3}$.

The writer quotes Mooren and Rothmund, in commendation of this operation (iridotomy), lately revised and systematized by Wecker, the former specially lauding it in cases of secondary cataract.

A case of advancement of the internal rectus after its complete detachment by a blow from a pump handle, is recounted at length, with a new instrument for seizing the muscle, a sort of brise-pierre hook. A successful case of keratoconus is given where the apex of the cone was cut off, and the resulting ulcer, after cauterizations with nitrate of silver, was slit up in the method introduced by Sœmisch for serpiginous corneal ulcers. A year later the cornea had flattened, with a small leucoma, and vision was improved. The report advocates the slitting of detached retina with needles, although admitting the frequent futility of the attempt, and gives an unsuccessful case where there was a large detachment of long standing, with numerous vitreous opacities. Apropos of retinal detachments, Dr. Masselon dilates on the proper method of taking the field of vision, and on account of its rapidity, advocates taking the field on a blackboard, and converting the result by calculation into corresponding field as given by a perimeter. The method used is that previously given by Dor, in the *Archiv für Opthalmologie*, xix. 3, p. 319. No reference is made to the curved blackboard introduced for the purpose by Scherk, which allows the

field to be taken with the same accuracy as the perimeter, and with the same rapidity as a blackboard or other campimeter.

The subject of dermic and conjunctival grafts is discussed, and the author, although admitting that the method is confessedly unsuccessful in general surgery, maintains that, owing to the usually smaller amount of surface to be covered, it may still be of use in eye surgery. He thinks that amputated limbs should furnish most of the material, and relates, as proving the practicability of obtaining live integument by purchase, that he has recently seen sales of it among the patients at the clinic at the rate of ten francs the square centimetre.

Dr. Masselon claims that the transplantation of the conjunctiva of the rabbit has been twice successful at Wecker's clinic, with a view of enlarging a socket sufficiently to allow the use of an artificial eye, and believes that in spite of the ultimate disappearance of the animal tissue there cannot be the slightest doubt that such grafts are successful in preventing the reunion of the lids with the ball, or with the stump left by injury or operation.

He concludes his report by quoting the cases reported by Illing of Vienna, who used for his grafts, in one instance, mucous membrane from the mouth, and in another, mucous membrane from the vagina. Although so successful in inducing his patients to part with portions of their skin for the benefit of others, he thinks the proposal of Becker to induce patients with blind eyes to part with a portion of their conjunctiva will necessarily be unsuccessful, and believes that experience will determine whether it is best, in order to obtain grafts, to have recourse to the conjunctiva of animals, to other mucous surfaces, or to conjunctiva from other individuals. W. F. N.

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Art. XXXIII.—*Cyclopædia of the Practice of Medicine.* Edited by Dr. H. Von Ziemssen, Professor of Clinical Medicine in Munich, Bavaria. Vol. III. *Chronic Infectious Diseases.* By Prof. Christian Baumler, of Erlangen; Prof. Arnold Heller, of Kiel; and Prof. Otto Bollinger, of Munich. Translated by Arthur H. Nichols, M.D., of Boston; William Ashbridge, M.D., of Philadelphia; James G. Hyndman, M.D., of Cincinnati; and Edward B. Bronson, M.D., and Edward L. Keyes, M.D., of New York. Albert H. Buck, M.D., of New York, Editor of American edition. 8vo. pp. xii., 672. New York: William Wood & Co., 1875.

The third volume of this admirable series contains articles on the chronic infectious diseases. Under this head Dr. Ziemssen includes—1, syphilis; 2, infection by animal poisons, viz., glanders, anthrax, hydrophobia, the foot and mouth disease, and infection by the bite or sting of poisonous animals; 3, diseases from migratory parasites, such as the Echinococcus, the Cysticercus cellulosæ, and the Trichina. The subject of syphilis has been committed to Prof. Baumler, who has left nothing to be desired in the manner in which he has done his work. We are acquainted with no other treatise in which the student will find contained, in a comparatively small space, as much useful information in regard to all that relates to this disease. He regards syphilis as "a chronic, infectious disease, whose course, though protracted, is not, on this account, less typical than that of other infectious diseases." "But in this disease," he adds, "the different stages lie so far removed from each other that the connection between their symptoms is not at once manifest." This is precisely the same view as Mr. Hutchinson has taken in his

article in *Reynolds' System of Medicine;* and, indeed, there is much in it that is both attractive and convenient. Thus syphilis, like the acute infectious diseases, has a period of incubation, which is followed by a stage bearing considerable resemblance to the eruptive stage in the latter class of diseases, while the sequelæ of these may be regarded as the analogues of the lesions of the tertiary stage of the former.

In regard to the asserted introduction of syphilis into Europe from this country by Columbus's sailors, Prof. Baumler brings very strong evidence in favour of the theory that the disease existed in certain portions of Europe—more especially in the southern part—prior to the epidemic outbreak of the disease in Italy at the end of the fifteenth century, in the same way, perhaps, as it yet prevails in certain retired localities in the form of an endemic disease. Various circumstances at that time combined to favour this outbreak. Among these may be mentioned the peculiar pilgrimages and the crusades of the previous century, which had had the effect of establishing more intimate relations between the different nations. Wars, too, had been frequent, and these, with the causes above named, had tended to deprave the morals of the people and to give occasion to all kinds of licentiousness.

The author devotes considerable space to a discussion of the subject of the unity or duality of the syphilitic poison, summing up his conclusions in the following paragraph:—

"Hence we accept only one syphilitic poison, but in another sense from that given to it in the doctrine of unity. We do not regard the contagious principle of chancre (chancroid) as identical with this poison. It is a pathological agent by itself, but a far less constant and uniform one than the poison of syphilis; since we have seen that it may be generated *de novo* under the co-operation of certain influences, and quite independently of syphilis."

The experiments which show that this chancroid poison may be generated *de novo*, are, we think, of sufficient interest and novelty to be briefly recounted here, proving, as they do, that the chancroid is of less specific nature than has been hitherto generally supposed; and that perfectly ordinary, non-specific pus, inoculated upon syphilitic subjects, causes soft ulcers which may also be inoculated in generations. Thus, at Zeissl's suggestion, Pick inoculated pus from scabies, pemphigus, and acne pustules (which pus, when inoculated upon the bearers of these affections, or other non-syphilitic persons, gave a negative result) upon syphilitic subjects, with the result of producing soft sores, from which still other inoculations could be made. These experiments were successfully repeated by Kraus and Reder, and by Henry Lee. Therefore it would appear that the skin of syphilitic individuals possesses a marked vulnerability, a peculiar aptitude to become inflamed when acted upon by irritants. Indeed, Kaposi goes still further, having recently published the results of some investigations which completely divest the soft chancre of its specific character. These, it is true, still need confirmation; but should their correctness be established by other observers, as Prof. Baumler says, "the doctrine of the identity of the syphilitic and chancre poisons, or even of a relationship between them, will lose its principal support." Kaposi's experiments have taught him, he says, "that non-syphilitic pus, such as we find in acne and scabies pustules in non-syphilitic persons, when inoculated upon the bearer, as well as upon other non-syphilitic persons, produces pustules whose pus proves to be inoculable in generations; that loss of substance was caused by the pustules, which healed by cicatrization, and that with the increase in the number of the pustules produced by the inoculation the contagiousness of the pus diminished, and finally became quite extinguished." The chancroid is therefore, in Prof.

Baumler's opinion, a thing by itself, so that "when only a simple chancre is produced by the inoculation of a healthy person with pus from a chancroid, there is no danger afterwards of transmitting syphilis in any further inoculations which may be made from this simple chancre; for there has never yet been a single instance where syphilis was caused by the inoculation of chancre-pus from an individual who had only chancre, and not syphilis." He admits, however, that both poisons may be conveyed from one individual to another at the same time, and that this may very readily be done if a true chancre has been excited to free suppuration by the application of an irritant ointment—as, for instance, savine ointment—or if, in experimental inoculation, the blood of a syphilitic individual be mixed with such pus.

Another point of interest to which Prof. Baumler also alludes is the fact that in some instances the inoculation of syphilitic secretions upon a syphilitic subject has been followed by the development of an indurated papule, after the lapse of a considerable period of incubation (from three to four weeks). But in all the cases, with a single exception, in which a second inoculation produced its usual effect after the syphilitic primary affection had already been developed, this inoculation, he says, was made before the disease had progressed so far as to involve the whole organism. There are other cases on record, to which he also refers, where, after experimental inoculations of the syphilitic poison upon healthy subjects, the usual local symptoms appeared after a considerable period of incubation, and yet were not followed by symptoms of general infection.

When speaking of the prophylaxis of the disease, Prof. Baumler says that all attempts to limit the spread of the disease must fail, unless these include some sort of supervision of prostitution, since the experience of thousands of years has shown this to be an unavoidable evil, the suppression of which is impossible. In support of this position he adduces the improvement in the health of the troops in garrison towns of England and Belgium that has followed the supervision and examination of the notorious prostitutes of the place. This subject has, however, many sides, and any attempt to discuss it would carry us far beyond the limits of a bibliographical notice.

The author speaks with no uncertain sound in favour of the treatment of constitutional syphilis by mercury. "If," he says, "induration is developed in a suspicious erosion, particularly in one on the female genitals, or in an ulcer which began as a chancroid, and if the lymphatic glands of the part show a slowly increasing enlargement, the administration of mercury must not be delayed." But nothing beyond the slightest grade of mercurial stomatitis should be allowed to arise. After the remedy has been given for some time, he advises that it should be discontinued for two or three weeks, and then again employed. Recourse should be had to inunction whenever the state of the digestive apparatus forbids the internal administration of mercury; and also whenever it is desirable to obtain the action of mercury as speedily as possible; for instance, when the destruction of important organs, such as the eye, the brain, or the larynx, is threatened by the disease. Its tendency to cause an eczematous eruption in persons with delicate skins should, however, not be forgotten. He apparently prefers the bichloride to the other preparations of mercury for internal administration, but speaks favourably of blue mass, mercury with chalk, and of the protiodide. In the treatment of the symptoms of the tertiary stage it is scarcely necessary to say he has recourse to the iodide of potassium.

We have thus briefly brought to the notice of our readers a few points which have specially attracted our attention in a careful reading of Prof. Baumler's

article, and regret that the space and time at our command do not permit us to do this as fully as the importance of the subject deserves. The translators have, as in the preceding volumes, rendered the German of the original into good English. A little more care might, it is true, have been taken in the use of the words chancre and chancroid; and we can scarcely regard the expression on page 142, "This is not to be surprised at," as a very elegant one, even if we admit that it is good English, which we are not disposed to do.

The article on "Infection of Animal Poisons" is written by Prof. Otto Bollinger, of Munich; and that on "Diseases from Migratory Parasites," by Prof. Arnold Heller, of the University of Kiel. The names of these gentlemen are a sufficient guarantee of the excellence of their papers, which unfortunately we cannot, at present, more fully notice. J. H. H.

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ART. XXXIV.—*Clinical Lectures and Essays.* By Sir JAMES PAGET, Bart., F.R.S., D.C.L. Oxon, LL.D. Cantab., Sergeant-Surgeon Extraordinary to Her Majesty the Queen, Surgeon to H. R. H. the Prince of Wales, Consulting Surgeon to St. Bartholomew's Hospital. Edited by HOWARD MARSH, F.R.C.S., Assistant-Surgeon to St. Bartholomew's Hospital and to the Hospital for Sick Children. 8vo. pp. x., 428. New York: D. Appleton & Co., 1875.

THIS charming volume (for charming it is, both in matter and manner) consists almost entirely of various lectures and short papers reprinted from the pages of the journals and other medical periodicals in which they were first published, with occasional additions by the distinguished author, and with a score or so of notes (of which the chief are collected together in an appendix) by the able editor. Most of these papers were more or less fully noticed in this Journal at the time of their appearance, and it will not therefore be now necessary for us to enter into any detailed examination of their merits; we shall accordingly limit ourselves to a recapitulation of their titles, with a brief reference to certain points which seem to call for special attention.

The volume opens with three clinical lectures on the various Risks of Operations, appropriately followed by one on the Calamities of Surgery. Then come in succession a short paper on Stammering with other organs than those of Speech; a lecture on Cases that Bone-setters cure; four on Strangulated Hernia; a paper on Chronic Pyæmia; six lectures on Nervous Mimicry of Disease (Neuromimesis); one on the Treatment of Carbuncle; one on Sexual Hypochondriasis; papers on Gouty Phlebitis and Residual Abscess; a lecture (founded on personal experience) on Dissection-Poisons; a paper on Quiet Necrosis; one on Senile Scrofula; a lecture, or rather part of one, on Scarlet Fever after Operations; and Notes for the Study of some Constitutional Diseases. The volume terminates with an appendix of Mr. Marsh's notes, and an elaborate index.

Of these papers, all, we believe, except the last, and that on Sexual Hypochondriasis, have been already published, but every one will be found worthy of reperusal. The notes for the Study of Constitutional Diseases, though furnishing much food for thought, and amply reflecting the character of their writer as a student of philosophical surgery, will, we believe, not be as widely appreciated as the other papers in the volume, for the reason that (as hinted by the author himself in his introductory remarks) they deal with questions upon

which the experience of surgeons in general does not enable them to form an opinion. Perhaps the most valuable portion of the whole book is that which treats of the nervous mimicry of diseases; a subject which since Brodie wrote upon "hysterical joints" has always interested surgeons, but which has, so far as we know, never been so thoroughly and satisfactorily dealt with as in these lectures. Upon what are often, though with questionable propriety, called more practical subjects—for what can be more truly practical than the means of distinguishing organic from mimicked disease?—the reader may consult with advantage the papers on strangulated hernia and on carbuncle. We take this opportunity of reiterating the expression of our conviction that the so-called "do nothing" treatment recommended by the author in cases of the latter affection is the proper treatment: we know of no disease the victims of which have suffered and still suffer more from meddlesome surgery than those afflicted with carbuncle.

In his preface Sir James Paget apologizes for "the apparent disregard" in his book "of the works of others:" we beg leave to say that no apology in the matter is necessary; those who want to know the views of surgeons in general, or to ascertain what has been written in various parts of the world upon any particular subject, will naturally have recourse to systematic treatises and monographs, and if they do not find there what they need, will have a right to be disappointed; but no one, we feel confident, will take up Sir James Paget's volume with any desire other than to find out what are its distinguished author's individual opinions, and no one, we feel equally sure, will lay the book down without a feeling of gratitude to the writer for his numerous and admirable contributions to the science and art of surgery.

Of Mr. Marsh's notes we have only to say, and we think it high commendation, that they are not unworthy of the text to which they are appended.

Though the volume bears an American imprint, it is all English except the binding, the catalogue inserted at the end, and the title page; had the publishers selected for the latter a paper more nearly resembling in tint that upon which the work itself is printed, they would have better consulted the æsthetic taste of their customers.

J. A., JR.

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ART. XXXV.—*The Successful Treatment of Internal Aneurism by Consolidation of the Contents of the Sac. Illustrated by Cases in Hospital and Private Practice.* By JOLIFFE TUFNELL, F.R.C.S.I., M.R.I.A., President of the Royal College of Surgeons of Ireland; Ex-Regius Professor of Military Surgery, etc. Second Edition. 8vo. pp. 71. London: J. & A. Churchill, 1875.

THE first edition of Mr. Tufnell's pamphlet was published in 1864, and was the subject of a full notice, from the skilful pen of Dr. W. F. Atlee, in the number of this Journal for April, 1865. The number of cases upon which the author's remarks are based, has been increased from five to eleven (including one case of popliteal aneurism), and Mr. Tufnell has taken advantage of the call for a second edition, to incorporate in his work such additional hints for treatment as have been furnished by his prolonged experience. Mr. Tufnell's method is, as our readers doubtless know, a modification of that employed by Valsalva, consisting essentially in the enforcement of absolute rest in the recumbent posture, in regulation and limitation of the diet, and in the administration of anodynes, with laxatives and tonics in cases requiring their use.

Mr. Tufnell has adduced enough evidence in favour of his mode of treatment to fully warrant him in giving it the name of "successful;" not, as he very

justly points out, that by his plan recovery can be insured in every case of internal aneurism, but that his method has proved, and, if properly carried out, will prove successful in cases which would otherwise be hopeless. Moreover, Mr. Tufnell's plan has the great advantage that even when it does no good, it at least does no harm—a merit which unfortunately cannot be attributed to the "rapid pressure treatment" (which is, besides, manifestly inapplicable to cases of thoracic aneurism), and still less to the galvano-puncture, iron wire, and horse-hair methods with which some surgeons have experimented of late years.

It is not very much to the credit of our profession, that the success obtainable by Mr. Tufnell's mode of treatment has been so long known without having more forcibly influenced the practice ordinarily adopted; had Mr. T. gained half as good results by the introduction of some new, difficult, and dangerous operation, we venture to say that his example would have found more imitators.

The three plates which accompany Mr. Tufnell's pamphlet are beautiful specimens of the chromo-lithographic art. J. A., JR.

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ART. XXXVI.—*Ricerche Intorno Alla Bilharzia Hæmatobia in Relazione colla Ematuria Eudemica dell' Egitto; e nota intorno ad un Nematoideo trovato nel sangue umano.*

*A Research concerning the "Bilharzia Hæmatobia" in relation to the Endemic Hæmaturia of Egypt; and an account of Nematoda (filliform entozoon) found in Human Blood.* By Dr. PROSPERO SONSINO. Cairo, April 20th, 1874. 4to. pp. 13.

THIS contribution to helminthology is based upon an examination of ten cases of the "special endemic hæmaturia of Cairo" observed by the author, and due to the presence of the *distoma hæmatobia*, better known, perhaps, by the name of *Bilharzia hæmatobia*, from its discoverer, Dr. Bilharz, Professor of the School of Medicine of Kasr-el-Aeni, who described it in 1851. Reyer, of the same school, proved its coexistence with calculus; and Henry Meckel found a central nucleus in a stone, which consisted of a collection of the eggs of the entozoon.

The disease is a very common one in Egypt, and probably exists more or less throughout Africa, as it has been found at the Cape of Good Hope; it has also been discovered in the monkey. Dr. Bilharz thought that half the adults of Egypt were affected by it. The natural habitat of the worm is in the blood-vessels, but the ova and embryo may be found by examination of the urine.

The disease appears thus far to be beyond remedy, except such as may be palliative. A parasiticidal treatment would theoretically appear to be the correct method, but cannot be carried out in practice, except where the entozoa are found in the alimentary canal, or at the surface of the body. The paper of Dr. Sonsino throws no new light upon this important point. He gives some rude microscopical drawings of the ova found in the urine, and a sketch of two *nematoda*, which he claims to belong to a new species, that he found in the blood of one of his ten patients, a boy of fifteen. Six of his subjects were boys of 12 to 15 years of age; three from 16 to 19; and only one an adult, who was 35.

The origin of this fatal malady is believed to be dietetic; but what order of food, is unknown. It has been attributed to the water of the Nile, to its fish and molluscs, and even to bread, grain, and fruit; but these views are simply

conjectural. The *Nematoda* are so large a class, and with such slight shades of difference, that we cannot tell, from the author's description, whether his is a new variety or not. In view of the fact that there are from five hundred to eight hundred varieties, many of them with scarcely a shade of difference, the discovery of a new one is of very little moment. What is wanted is the discovery of the sources of human entozoa, that their entrance into the system may be prevented. R. P. H.

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ART. XXXVII.—*A Series of American Clinical Lectures.* Edited by E. C. SEGUIN, M.D. Vol. I. No. ii. *Acute Rheumatism in Infancy and Childhood.* By A. JACOBI, M.D., Professor of Diseases of Children in the College of Physicians andSurgeons, New York. Pamphlet, pp. 38. New York: G. P. Putnam's Sons, 1875.

DR. JACOBI'S lecture on "Acute Rheumatism in Infancy and Childhood" fully sustains the enviable reputation he has won for himself as a careful and accomplished writer on the Diseases of Children. Taking three interesting cases as the basis of his remarks, he first gives us his views of the nature of rheumatism, and then passes on to speak of the symptoms of the disease in early life, and of the points of difference between these and those presented by adults. He concludes his lecture after properly considering the subjects of diagnosis and prognosis, by a discussion of the questions involved in treatment. Neither the theory which makes the disease dependent upon the circulation in the blood of some foreign material, such as lithic acid or lactic acid, nor that which classes it among the pure neuroses, and which was, we believe, originally proposed by the late Dr. J. K. Mitchell, of Philadelphia, has yet been proven, and Dr. Jacobi finding them both unsatisfactory, thinks "it is much more rational to assume that some changes in the bloodvessels must coëxist with the multiple fluxions which constitute the fundamental phenomena of the disease," adding that in rheumatism "the cause of the various effusions would lie, no matter what its original source will be found to be, on the whole surface of the intima of the bloodvessels from the endocardium to the smallest artery or vein, even the vasa-vasorum. Endocarditis, then, would not be the complication of rheumatism, but its highest and most developed expression."

Rheumatism in children presents in Dr. Jacobi's opinion several peculiarities, the most important of which are the following: Swelling of the joints less marked and less permanent; pain not so excessive; redness less intense; temperature not so high, and in some cases not at all raised; no greater liability of males than females to the disease, and greater tendency than in adults to serous as distinguished from fibrinous effusions. Delirium is more common in adults, convulsions in children. Unless there is endocarditis, respiration is in proportion to the fever; perspiration is not copious, urine scanty, and not loaded with uric acid; on the contrary, he says, it is frequently copious and pale. The course of the disease is, perhaps, less regular than in adults. His experience has also led him to the conclusion that the disease is not so rare in children as is generally supposed, and that heart troubles are exceedingly frequent. In fact, Dr. Jacobi looks upon the absence of this complication as exceptional; in this agreeing with Picot and Claisse, who found it in 37 cases out of 47, and in 14 out of 18, respectively. He ascribes this greater prevalence of heart disease in the very young to the greater physiological activity of the organ, which of course renders it more liable to become the seat of pathological changes. Notwithstanding this fact the disease ends fatally less frequently in children than in adults.

While admitting with Dr. Kirkes that chorea occurring during or after an attack of rheumatism is generally caused by cerebral embolism, the author, nevertheless, finds the theory inadequate to explain its occurrence in those cases in which it is the earliest manifestation of rheumatism, appearing before the swelling of the joints, or even before the signs denoting endocardial inflammation. In these cases, he believes that there must be some lesion either in the organ of the will, or the centre of co-ordination, or some other parts of the nervous centre, but in view of the readiness with which the symptoms disappear in the majority of instances, he says the anatomical change cannot be great. It is probably an alteration in the nutrition of the parts. In some cases it would seem to be hyperæmia or inflammation of the spinal meninges.

The diseases most likely to be mistaken for rheumatism are affections of the bones involving the joints, and various neuralgias; but the exercise of a little care will generally enable us to make a correct diagnosis. The treatment which Dr. Jacobi recommends is simple. The joint should be placed in an easy position, and, this having been done, its vascularity should be reduced either by local depletion, or, by what is far better in the author's opinion, the application of ice. Later he advises the use of poultices, warm water, blisters, and pressure, in the order named. Of internal remedies he relies most on veratrum to relieve vascular pressure and to reduce the frequence of the pulse, and on quinia as an antiphlogistic. To be at all efficacious the latter remedy should, in his opinion, be given in a dose of five grains, once, twice, or three times daily, to a child of one or two years, since he has found that quinia is tolerated and required by the young in apparently disproportionate doses. He prescribes iodide of potassium not merely as a diuretic, but also in consequence of the power which he believes it possesses of restraining the transformation of cells into connective tissue. He apparently attaches very little importance to the administration of the alkalies.

In the management of those cases of acute chorea depending upon meningeal or medullary congestion or inflammation, he prefers ergot. This should be given in large doses, half a drachm of the fluid extract, repeated three or four times daily. Given in less quantity than this it will generally fail to do any good. Its use may be persevered in for many weeks in succession, and has never to the author's knowledge given rise to any bad results.

In conclusion, it gives us great pleasure to put on record the gratification and instruction we have derived from reading this lecture. J. H. H.

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ART. XXXVIII.—*A Series of American Clinical Lectures.* Edited by E. C. SEGUIN, M.D. Vol. I. No. vi. *Otitis.* By C. R. AGNEW, M.D., Clinical Professor of Diseases of the Eye and Ear in the College of Physicians and Surgeons, New York. 8vo. pp. 22. New York: G. P. Putnam's Sons, 1875.

THIS is one of the series of American Clinical Lectures edited by Dr. Seguin, and is addressed, not to aurists, but to medical students and general practitioners.

No one whose special practice brings before him the results of the frequent mismanagement of this very common disease, will deny that the subject of this little pamphlet has been well chosen, and that it has a useful mission to perform. The author dwells upon the fact that a large proportion of cases arise from "taking cold," and the first pages of the lecture are devoted to detailed instructions how to avoid this cause by attention to clothing, food, exercise, and habits of life.

In the directions for treatment, free incisions of the meatus in furuncular inflammation, and early and frequently-repeated paracentesis in otitis media are strongly recommended. On the latter point the author goes beyond most authorities, and, it seems to us, rather underrates the difficulty of the operation when he states that any one who "can pass a key into a night-latch can incise a drum-head." We know a good many people who find no difficulty, with perhaps occasional exceptions, in passing a key into a night-latch, whom we would rather not trust to puncture our ear-drum. "Paracentesis every day or every other day for a week or more" is very painful, if not rather heroic, treatment, and we have never met with a case in which it seemed to us to be necessary.

The treatment of acute inflammation of the tympanum is summed up as follows: "Leeches, warm fomentations, paracentesis, Politzer's inflator, anodynes." The omission of any mention of the warm-water douche or frequent gentle syringing with warm water, so useful and safe, and so universally recommended, is probably accidental.

When, in cases of otitis media, there is an extension of the inflammation to the skin and periosteum of the external meatus, shown by a tender swelling, the importance of making a free incision is urged. "This early cutting will give great relief from pain, and perhaps prevent the formation of a carious fistula through the bony wall of the canal into a neighbouring mastoid cell."

The "busy practitioner" will find in this pamphlet much valuable information pleasantly conveyed, and a useful guide in the treatment of a class of cases that he is sure to meet with not only once but often. G. C. H.

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ART. XXXIX.—*Résumé of a Report on Position, Pneumatic Pressure, and Mechanical Appliance in Uterine Displacement, read before the Georgia Medical Association of Savannah*, April 23, 1875. By HENRY FRASER CAMPBELL, A.M., M.D. 8vo. pp. 18. Atlanta, 1875.

THE writer proposes to make the patient replace her uterus at night before retiring, by causing the bowels to gravitate towards the diaphragm, and then aiding the suction thus produced, by admitting air into the vagina by means of a small glass tube furnished her for introduction when in the "genu-pectoral position," which he thus describes, viz.:—

"Let the patient loosen all strings and fastenings of the dress and corsets, and place herself on the bed on her knees, bending the body forward, till the head and thorax are brought down to the same plane as that on which the knees are resting, viz., the surface of the bed. The face may be turned to one side, resting on the two hands, while the elbows are thrown out widely from the sides. The knees are to be separated from five to ten inches. The thighs must be perpendicular to the surface of the bed." (p. 4.)

"All that is necessary for self-replacement is the introduction of the *repositor* for a moment or two." (p. 6.)

The "Pneumatic Self-Repositor" is described, and shown by a wood-cut, as a glass tube of various forms, from two and a half to three inches long, slightly curved near the end, and bulbous, to admit of easy introduction.

*Nightly self-replacement* is recommended not only in the ordinary uterine displacements, but to relieve pregnant women in their early stage, from the sense of weight, downward pressure, etc. etc., arising from uterine gravitation.

He also recommends inflating the rectum, as with a colpeurynter, in certain cases of retroversion, to dislodge the fundus from the hollow of the sacrum,

and then completing the replacement by the admission of air into the vagina as before described.

The paper is illustrated by several wood-cuts showing the position of the woman, and the internal changes produced by the action of gravitation and suction. R. P. H.

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ART. XL.—*The Physiological Reasons Why.* By ALEXANDER HUTCHINS, A.M., M.D. 8vo. pp. 50. Brooklyn, New York, 1875.

THIS closely but elegantly printed pamphlet is a reprint, from the Brooklyn Journal of Education, of an essay to which a prize offered by the New York State Medical Society was awarded. Its subject, not very obvious from its principal title, is school hygiene with reference to the Physiological Relations of Age and Sex to Mental and Physical Education. It is a somewhat peculiar production. One moment we come to some long and difficult passage where we seem to get shadowy glimpses of ideas through the fog of words, and are harassed by unpleasant doubts whether we are stupid or our author unusually profound. Then on the same page the chances are that we encounter crisp sentences that carry home their meaning with a crack like a rifle, and with an aim as true.

The essay is divided into three parts. The first treats of "The Problem," which seems to be the development or education of the growing mind and body. This can be properly solved only by much greater intelligence and thoughtfulness in parents. The latter are really responsible for the excesses and bad methods of the schooling. To be rid of the children many hours and to have them taught from many books are too generally their only care. Physical growth and health are not thought of. The State cannot afford to instruct the minds of its children at the expense of their bodies. Uniform and rounded development, not partial and one-sided culture, makes profitable citizens. But as "laws follow, and do not anticipate public opinion," the State cannot as yet prescribe rules for protecting and securing physical development.

The true end, even of mental training, is mistaken by parents. Discipline, the power to use the mind, should be the aim; but parents wish their children crammed with facts.

Part second deals with "The Material," opening with a somewhat abstruse exhibition of the character of sexual difference, which is fully recognized and appreciated. The exposition of likeness and unlikeness is extremely forcible and closely reasoned. Unlike Dr. Clarke's argument, however, it is addressed rather to the philosopher and the scientist, than to the popular understanding. That there is agreement in the conclusions of the two writers may be seen by the following sentence of Dr. Hutchins: "Woman, therefore, is a law unto herself, and the conditions of her best physical and psychical development are imposed by the laws of her organization."

The latter portion of this division of the essay notes the fact that the "material," both male and female, is, during the school years, undergoing the natural growth or development from childhood towards adult age. This condition limits and prescribes the amount and kind of education which can be safely attempted.

Part third treats of "The Process." The duty of the physiologist and the student of social science is to point out the mistakes of modern educational methods and urge upon parents and teachers their correction. All influences of school work, objective or subjective, which interfere with a healthful, co-ordinated growth of body and mind, are to be exposed and removed. The author

goes on to apply his principles to school-life under the following aspects. Apportionment of time, as to age of pupils and hours of confinement: character of the application, as to amount and kind of work, and the rest and physical exercise to be mingled with it: the dependence of school on home hygiene, showing the duty of parents to send their children to school well and not ill, and to closely watch over their physical health: identical and co-education, as to which, like Dr. Clarke, he condemns only the latter: the purposes of the higher education defined by structure; the ends and aims sought to be achieved will be modified by the sex of the student.

This latter division of the essay is, as might be anticipated, more practical in its tendency, and should perhaps be excepted from our former intimation that the paper was not adapted to popular reading.

Of the brilliant and vigorous utterances of condensed thought which so agreeably relieve the occasional passages of obscurity or stilted diction, we had marked some dozen or two for quotation, but must refrain and be content with commending the work to our readers. B. L. R.

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ART. XLI.—*Clinical Studies with Large Non-emetic Doses of Ipecacuanha.* By ALFRED A. WOODHULL, M.D., Assistant Surg. U. S. A. 8vo. pp. 63 Atlanta, 1875.

*Clinical Studies with the Non-nauseating Use of Ipecacuanha, chiefly in Intermittent Fever.* By ALFRED A. WOODHULL, M.D. 8vo. pp. 23. Atlanta, 1875.

IN the first of these pamphlets, Dr. Woodhull relates twenty-four cases of dysentery beneficially treated by non-emetic doses of ipecacuanha, thus confirming the favourable reports made years ago by the British army surgeons in India, and also the experience of many practitioners in this country who have adopted this mode of treatment.

Dr. Woodhull's analysis of the cases he has reported demonstrates two facts—first, as to the promptness with which the ordinary sporadic dysentery yields to large doses of ipecacuanha; and, secondly, that in 20 and 30 grain doses it is not necessarily followed by emesis.

"There are two methods of administration," Dr. W. states: "On an empty stomach give from fifteen to twenty-five minims of the tincture of opium in a small quantity of water; fifteen or twenty minutes later apply a counter-irritant to the epigastrium, and at the same time give the powdered ipecacuanha in as little water as possible. With care a little more than two fluidrachms of water will make thirty grains of ipecacuanha into a paste sufficiently liquid to be swallowed. Or, for those who take pills easily, that form may be employed. In such cases the opium, in the proportion of one grain to twenty, may be incorporated in the pill. Twenty-five grains of ipecacuanha can be put up into two boluses, or twenty-five grains of that drug and one of opium will make up in four pills. Laudanum might be used in the pill form of ipecacuanha, one advantage of which is that the local effect of the opiate is not dissipated before the other drug begins to be absorbed. Recumbent rest must be strictly maintained, and no food nor drink be taken for at least four hours and usually longer. The dose may be repeated in from two to six hours, or, should the first be rejected, the second may be given as soon as the stomach is settled. In India sixty and more grains at one dose have been retained. I incline to think that, where the stomach is empty, the medicine acts non-emetically in direct proportion to the severity of the attack."

Dr. Woodhull quotes many authorities in reference to this mode of treatment and to the therapeutic properties of ipecacuanha, and indulges in some hypotheses which we do not propose now to discuss.

In his second pamphlet Dr. Woodhull relates twenty-three cases of intermittent fever, all but one of which were successfully treated by ipecacuanha "given in varying quantities from one grain to twenty." His impression is that one or two grains every three or four hours is the best method for ordinary chills. "Large doses did not," he says, "appear to exert a beneficial effect in proportion to their size. If large doses are used, it is well to guard them with small quantities of opium, and to observe the precautions of recumbent rest and abstinence. In one-grain doses abstinence from fluid is usually all that is necessary."

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ART. XLII.—*Cantho-plasty as a Remedy in Certain Diseases of the Eye.* By C. R. AGNEW, M.D., Clinical Professor of Diseases of the Eye and Ear, College of Physicians and Surgeons, New York; Surgeon to the Manhattan Eye and Ear Hospital, etc. Pamphlet pp. 10. G. P. Putnam's Sons, 1875.

AFTER a brief statement of the hygienic and therapeutic measures needed to contend successfully with phlyctenular inflammation of the eye, the author mentions the well-known clinical fact that cases present themselves in which the disease is obstinately persistent, or has a tendency to recur; and in which ulcer of the cornea or pannus, etc., renders the prognosis unfavourable, and demands more energetic treatment.

He compares the spasm of the orbicularis to a similar condition resulting from an irritable ulcer in the rectum, and urges a surgical treatment analogous to the division of the sphincter ani. He gives his testimony in favour of the operation known as Cantho-plasty, and describes, with good illustrations, the method which his clinical experience has found best, and concludes his paper with a list of one hundred and ninety-one cases in which it has been performed.

His large experience and reputation as a careful clinician render this contribution of value, and his advice can be fully accepted by the general practitioner, who has exhausted his therapeutical resources in the obstinate cases.

W. T.

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ART. XLIII.—*Transactions of the College of Physicians of Philadelphia.* Third Series. Vol. I. 8vo. pp. 192. Philadelphia, 1875.

THIS elegant volume reached us too late for a full notice, but this will be the less regretted by our readers since full abstracts of the papers it contains have been already laid before the profession in the pages of this or of contemporary journals.

Besides a list of the officers of the College the volume contains twelve papers by eleven authors, with two chromo-lithographs, and twenty-nine wood-cuts. All these papers are valuable contributions to our science, and they are presented in a style creditable to the taste of the committee of publication, and worthy of the venerable and eminently respectable body under whose auspices they are published.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES

IN THE

# MEDICAL SCIENCES.

## ANATOMY AND PHYSIOLOGY.

1. *Animal Heat.*—M. Cl. Bernard made an interesting communication on the subject to the French Association for the Advancement of the Science at its recent meeting. He treats of it especially in a topographical point of view. He recalls the fact that the source of animal heat has been successively located in the lungs, in the capillaries, in the muscular tissue, etc. M. Bernard asserts it has no single source; heat is generated everywhere, but there are points where it is higher, all being regulated by definite laws. According to Lavoisier, arterial blood has a higher temperature than venous; which M. Bernard maintains is entirely erroneous, as shown by his experiments.

M. Bernard draws from his researches the following clinical conclusion, viz., that fever is a purely nervous phenomenon resulting from modification of disturbances in the nervous system. He believes that there exist two orders of vaso-motor nerves—dilators and constrictors. Fever is the result entirely of profound modifications of this system, the principal result of which is an elevation of temperature.—*L'Union Médicale*, Sept. 4, 1875, and *Revue Scientifique*, August 28, 1875.

2. *Composition of Pus and mode of formation of Leucocytes of Pus.*—In a memoir recently presented to the Academy of Sciences, M. Bergeret, of St. Léger, gives the results of a long series of investigations he has undertaken in regard to the composition of pus, and the mode in which the leucocytes it contains are formed. He finds that every collection of pus, whatever may be its origin, contains pyocites in three stages of development. 1. Young leucocytes not more than twenty-four hours old. These contain mobile corpuscles of various sizes and forms—globular, linear, cylindrical, in chaplets, or dumb-bell-shaped, or hemispherical, and conceal the nuclei. The pus-corpuscles are highly hygrometric, and, when immersed in water, swell till they burst, discharging their granular contents and nuclei into the surrounding medium. 2. Young leucocytes from twenty-four hours to four days old. The nuclei of these are very apparent; a portion of their contents is still mobile, the remainder is attached to the nuclei and renders them granular. These leucocytes are smaller than the former, and irregular in form, in consequence of the envelope having contracted adhesions to the nuclei. They are less hygrometric, but still swell in water usually more or less irregularly; and the granules they contain, at first quiescent, soon begin to move, and escape when the envelope bursts. 3. Old leucocytes, the age of which is more than four days. These are small and crenulated, have lost their hygrometric properties, and their

granules are no longer capable of reacquiring movements after imbibition of water.

In addition to the leucocytes, pus is also composed of serum, and in the serum float numerous mobile granulations of the same form as those contained in the interior of the leucocytes; their movements are, however, much more free, and whilst some may be observed merely to oscillate, others traverse the field of the microscope with more or less rapidity and in every direction. These granulations also, like those in the pus, only remain lively for about four days. After this they group themselves together, and form the small amorphous granular masses which are always met with in collections of pus, but especially in chronic abscesses.

M. Bergeret explains the formation of pus in a blister by pointing out that on the under surface of the detached epithelium there is a layer of amorphous mucus, which constitutes a pyogenic medium. He is opposed to Virchow's views.—*Lancet*, Sept. 4, 1875.

3. *Presence of Fluid in the Sac of the Dura Mater.*—Dr. E. HITZIG, of Berlin, points out the exact situation of the extra-ventricular fluid within the skull. It is the almost universal experience of pathologists that after death the dura mater is applied to the surface of the brain; or, in other words, that the parietal layer of the arachnoid is applied to the visceral. When fluid exists outside the ventricles, it is not met with in the cavity of the arachnoid, but in the meshes of the pia mater, or the subarachnoid spaces. Hence there have arisen serious doubts whether this sac of the dura mater or arachnoid, using these terms as equivalent, is properly a serous sac. The present author, in his numerous vivisections of dogs, has convinced himself of the existence of fluid in the sac of the dura mater in the living animal. He has observed a hundred times that when the skull is trepanned, and a cut made in the dura mater, fluid wells out in no insignificant quantity. He found, however, that if the head of a dog is examined twenty-four hours after death, there is no fluid in the sac; but if a wedge-shaped piece of brain substance is cut out, the apex opening the ventricle, the cavity becomes filled with fluid. The question is, What has become of the fluid which during life existed in the sac? He believes it to be absorbed by the brain substance, and that its absorption is due, not to any hygroscopic character of the brain substance, but to the existence of an elastic pressure of the brain. During life the pressure of the secretion of the fluid counterbalances the elastic pressure of the brain, but after death the former disappears, and the latter, acting alone, causes absorption of the fluid. There are several facts confirmatory of the existence of this elastic pressure of the brain. If the skull of an animal be opened soon after death, fluid still exists in the sac, and exists at a certain pressure, welling out when the dura mater is opened. This pressure cannot be due to the pressure of the circulation, which has ceased, but must depend on brain pressure. Then, even after the entire absorption of the fluid, a cut made through the soft membranes causes the brain substance to project, showing a certain pressure. It has also been mentioned that, on the removal of a wedge-shaped portion of brain substance, the cavity is filled with fluid, which shows, at least, that the brain is not hygroscopic, and is presumptive of pressure. By opening the skull of dogs at various periods after death, it was seen that the absorption of fluid was gradual. From these observations the author deduces some hints as to the interpretation of certain facts by pathologists. It is evident that if fluid always exists in the sac of the dura mater during life, and is absorbed after death, the superficial layers of the brain substance must always be found in a state of maceration. From the existence of the elastic pressure it seems obvious that acute exudations will disappear much more rapidly after death than chronic ones—the long existence of the latter probably reducing the elastic pressure. These remarks apply to exudations both on the surface of and beneath the arachnoid. It is very possible that many an acute hydrocephalus externus is set down at post-mortem examination as an œdema of the brain. It also appears from these remarks that when we find fluid in the pia mater, either the brain has lost its elasticity, or it has diminished in volume, so

that in either case it no longer presses the fluid into its own substance. The author calls the attention of alienists to this subject, as well as to the fact, reported by some, of the rare existence after death of fluid in the sac of the dura mater itself.—*Glasgow Med. Journ.*, July, 1875, from *Reichert and Du Bois-Reymond's Archiv*, Part III., 1874.

4. *Cerebral Hemorrhage with Hemianæsthesia.*—The occurrence of hemianæsthesia in lesions of the cerebral hemisphere has thrown much light upon the localization of brain function. From the post-mortem researches of Türck, and the experiments undertaken by Veysierre, it has now been pretty well established that anæsthesia of one-half of the body is most marked when the lesion invades the white matter just outside the optic thalamus, where the cerebral peduncle passes into the radiating crown of Reil—the part called by M. Charcot and others the "internal capsule"—and the neighbouring white substance of the posterior lobe. A case recently related by M. Raymond at the Société Anatomique fully bears this out. It concerned a woman eighty-nine years of age, who was under the care of M. Charcot at the Salpêtrière Hospital, who was attacked with apoplexy. There was profound coma, partial right hemiplegia, and complete right hemianæsthesia (no kind of stimulus applied to the skin leading to any response). On the left side both motor power and sensibility were perfectly retained. There was no appreciable difference in temperature between the two sides. Death occurred on the day after the seizure; and there was found a recent clot in the left hemisphere, taking a linear direction from the anterior extremity of the nucleus caudatus to about four centimetres from the posterior part of the occipital lobe. It involved the whole of the island of Reil, as well as part of the lenticular nucleus of the corpus striatum. The caudate nucleus and optic thalamus were free. M. Charcot remarked on the riband-like form taken by the clot, as being determined by the direction of the bundles of nerve-fibres between the lenticular nucleus and the "external capsule."—*Lancet*, Aug. 14, 1875.

5. *Glycogenic Function of the Liver.*—Prof. Lussana, of Padua, asserts that glycogen is not a physiological product of the liver; that there is, as he expresses it, "no hepatic function of glycogenesis." This statement is made on the strength of a series of experiments extending over the last five years, in all of which the liver was examined immediately after death. Various animals—pigeons, fowls, frogs, rabbits, and dogs—were used. A large porcelain basin was kept ready full of boiling water, and the instant the abdomen was opened the vessels and ligaments were rapidly divided, and the liver removed and thrown into it. In the still boiling liquid the liver was cut up into very small pieces, this procedure lasting an hour, and then all was allowed to cool. The residue was then strained, and if necessary, repeatedly filtered, until the filtrate was absolutely colourless and transparent, and free from all albuminoid substances. In not a single experiment conducted in this way could Lussana detect the faintest trace of glycogen; on the other hand, this substance was always found in varying amount in livers which were not examined until some little time after the death of the animal, the quantity being proportional to the length of the interval which elapsed before examination.—*Med. Times and Gaz.*, Aug. 14, from *Centralblatt*, July 31, 1875.

6. *The Discharge of Ova, and its Relation in Point of Time to Menstruation.*—It is still a vexed question among physiologists at what period the human ovary discharges its products into the Fallopian tubes. The general belief is that the ova are thrown off towards the end of the menstrual flow or immediately after its cessation. Dr. John Williams, Assistant Obstetric Physician to University College Hospital, however, in a note communicated to the Royal Society, and published in *Proceedings* No. 162, brings forward a number of cases which tend to prove that the discharge of ova really occurs before the appearance of the monthly flow with which it is connected. In ten out of fourteen bodies of women dying of various diseases, either a day or two before, or two or three weeks after, the ordinary catamenial period, rupture of a

Graafian follicle, or hemorrhage into its cavity, had occurred before the return of the menses. Of the other cases—in one it was doubtful whether rupture of a follicle or the appearance of the discharge would have taken place first; in two a menstrual period had passed without maturation of a follicle; and in the fourth a periodical discharge was imminent, though the ovaries contained no matured Graafian follicle. Dr. Williams finds that other writers, who have recorded cases similar to his, in the main favour the view he supports. Reichert, however, who has examined the bodies of twenty-three women, in whose organs signs of menstruation were recognizable, arrived at the conclusion that rupture of the Graafian follicle takes place at an early stage of the menstrual flow.—*Medical Times and Gazette*, Aug. 28, 1875.

7. *Researches on the Mammæ of new-born Infants.*—Dr. DE SINETY has published (*Archives de Physiologie*, May—July, 1875) an account of some interesting investigations made by him in the histological laboratory of the College of France on the mammæ of new-born infants. From these researches he draws the following conclusions:—

1. That the milk obtained from the mammæ of new-born infants, some days after birth, is the product of a true secretion.

2. That the anatomical and physiological condition of the mammary glands at this period corresponds in many respects to that observed in adult females during lactation.

8. *Rotatory Motion of the Heart.*—H. WILKENS gives an interesting account of the motions of the heart as directly observed by him in the case of a man in whose thorax there was a wide fistula. By directing reflected sunlight into this fistula, the motions of the heart, covered by the pericardium, could be distinctly perceived. The heart was much displaced towards the right side. With every systolic act the left and rather sharp border moved forwards and to the right, the vertical groove, which could be seen through the pericardium, taking up a position at the same time more in the centre of the latter, a large portion of the left ventricle coming into view anteriorly. Simultaneously the whole organ was also distinctly observed to be forced downwards. These visible motions were further corroborated by actual examination with the index finger thrust in through the fistula. A small rod fastened to the heart near its apex (as was proved *post-mortem* by minute spots of extravasated blood), and to which another rod was attached transversely, showed that the point fixed in the heart described a curve, the concavity of which looked inwards, running from behind forwards and downwards. The author views the systolic rotatory motion of the heart, and of the impulse of the apex observed in this case, in the light of Bamberger's and Kornitzer's theory; and points out that the arrangement of the muscular fibres of the heart, and particularly of the middle spinal layer, must bring about a rotatory movement of the apex also during contraction, as was here seen (from the observer's right to left). He shows further that the rebound, according to Skoda, besides causing the heart to move downwards, must also favour the twisting, already commenced, of the whole organ.—*Dublin Journal Med. Science*, July, 1875, from *Deutsch. Archiv für Klin. Med.*, 1874.

## MATERIA MEDICA, GENERAL THERAPEUTICS, AND PHARMACY.

9. *Bromhydrate of Quinia.*—Prof. GUBLER states (*Journal de Thérap.*, July 10, 1875) that he has frequently employed this new preparation, both in private and in hospital practice, and that it has the advantage of being more rich in the alkaloid and more soluble in various menstrua than the sulphate of quinia. He gives usually 0.40 centigramme in two doses daily, sometimes reaching 0.60 or 0.80 centigramme; and, on very rare occasions, one gramme.

He has also used it hypodermically. The only case which he relates is one in which the bromhydrate was successfully employed in treating incoercible vomiting in pregnancy.—*Med. Times and Gazette*, July 31, 1875.

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10. *Physiological and Therapeutic Action of Nitrite of Amyl.*—Samelsohn protests against the prevailing idea that our knowledge of the physiological action of amyl-nitrite is sufficiently complete to serve as a basis for its remedial use. We do not understand the exact mechanism of the vascular dilatation caused by it, and we are equally ignorant of its extent and distribution. Our ignorance on those points should make us cautious.

Sander has recorded cases in which sudden collapse followed closely upon its administration. Samelsohn furnishes a detailed account of a similar instance. The patient, a somewhat anæmic young woman, suffering from symmetrical blepharospasmus, was being exhibited before the Medical Society of Cologne. It was suggested that the effect of nitrite of amyl upon the spasmodic closure of the eyelids should be tested. A narrow-necked phial, containing about fifteen grammes (225 grains), was held under one nostril, and the patient directed to take several deep inspirations. As soon as the usual change in the pulse occurred, the phial was withdrawn. The face, previously pale, was now suffused with a crimson flush, and the eyes opened widely. In an instant, however, the flush was replaced by a deadly pallor; the pulse became thread-like and slow, the skin cold and clammy, respiration difficult and gasping; consciousness was retained. These alarming symptoms passed off, but only to recur again and again; a full hour elapsed before the patient could be said to be out of danger. Even after the pulse and breathing had become normal, she still complained of feeling very cold; and this sensation lasted till the next day. The blepharospasmus disappeared for thirty-six hours, at the end of which time it returned. To what ought these symptoms be attributed? The sample of the drug was perfectly pure, and was repeatedly inhaled by other patients without producing any unusual effect. The dose was measured by its effect upon the pulse, and there was no reason to suspect that it was excessive. Sander ascribed the collapse which occurred in some of his cases to a contraction of the vessels of the pia mater, immediately consequent upon their undue dilatation, and causing cerebral anæmia. But on this hypothesis convulsive symptoms might have been expected to occur, and none such were noticed. Samelsohn prefers to explain the phenomena otherwise. As a general rule, the vascular tension is quickly restored after its depression by amyl-nitrite. In anæmic persons, however, we may suppose that the muscular walls of the vessels react less promptly, and that the elasticity of the arterial coats is impaired. Now it is well known that a sudden accumulation of blood in any part of the vascular area diminishes the supply of that fluid to the heart, placing it in the position of a pump with too little water to fill it, and thus embarrassing its action. Moreover, the girl was menstruating at the time, and the pelvic viscera were loaded with blood. That this was one of the factors concerned is rendered likely by the circumstance, that she subsequently inhaled the nitrite vapour more than once without any return of the symptoms which caused so much alarm on the first occasion.—*London Medical Record*, August 16, from *Berliner Klinische Wochenschrift*, June 14, 1875.

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11. *Physiological Action of the Preparations of Bromine.*—Dr. Steinauer observes that the value of the bromides is attributed by some therapeutists, as Schouten and Binz, to the alkali, whilst others consider it to be due to the bromine. In order to settle this point he made a series of experiments with different preparations of bromine, in some of which the preparation used consisted of a stable compound of bromine, and was eliminated by the urine in an unchanged condition, whilst in others the compound was instable, and was decomposed in the system, so that the bromine was discharged in the free state. The results of his experiments were as follows: 1. The bromine compound exhibits an energetic action only in those chemical compounds in which there is a possibility of the bromine atom being detached. Experiments with hydrobromic acid and monobrated acetic acid, made both upon cold-blooded

and warm-blooded animals, gave constantly the same results—namely, that, in doses in which the acetic acid of the compound subcutaneously injected in an equal state of dilution produced no effect at all (as in frogs in 0.005–0.3 grm. doses, and in rabbits in doses varying from 0.05–?), the monobromated acetic acid rapidly produced a lowering effect upon the pulse and respiration, until the heart was completely arrested. Researches made with the aid of artificial respiration showed that the action on the heart was the primary one. Other researches, in which after section of the vagi and after paralysis of its intra-cardiac terminal nerve-fibres with nicotin, after which the action of the bromine was still apparent, showed that the action of the bromine was essentially upon the heart itself. Lastly, researches in which the experiments known as Stannius' and Munks' failed showed clearly that the action of the bromine was to paralyze both the cardiac muscle and the excito-motor cardiac nerve centre. Steinauer further observed that the bromo-acetic acid effected a diminution in the excitability of the ganglia of the spinal cord, as well as of the peripheric nervo-muscular apparatus. After the administration of the poison the animal lost its sensibility for tactile (contact and pinching) and chemical (brushing with acid) stimuli, and the same occurred after elimination of the influence of the will upon movement by division of the cord between the occiput and first vertebra, no reaction being obtainable at a period when in other animals not under the toxic influence of the drug, mechanical and electrical excitation of the nerves still caused active contraction. The reflex paralyzing influence of the bromine was not referable either to the affection of the motor nerves or to the enervated muscles, but to its action upon the spinal centres.

In regard to those preparations of bromine which were so stable that the bromine would not separate, as in monobrombenzol and sodium bromo-benzoate, no free bromine appeared in the urine; it was found in these cases that the substituted atom of bromine caused an alteration of the nutritive processes and the action of other compounds.—*The Practitioner*, Aug. 1874, from *Virchow's Archiv*, lix. p. 65, and *der Prakt. Arzt.*, No. 2, 1875.

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12. *The Physiological Action of the Chinoline and Pyridine Bases.*—A paper on this subject by Dr. J. G. McKENDRICK and Prof. DEWAR was read before the Section of Anatomy and Physiology of the British Medical Association at its recent meeting at Bristol. The following is an abstract: It is well known that quinine, cinchonine, or strychnine yield, when distilled with caustic potash, two homologous series of bases, named the pyridine and chinoline series. Bases isomeric with these may also be obtained by the destructive distillation of coal, or from Dippel's oil, got from bone. Greville Williams has pointed out that chinoline obtained from coal-tar differs in some respects from that yielded by cinchonine. In this research, the author endeavoured to ascertain (1) the physiological action of the various members of the series; (2) whether there was any difference in this respect between the members of the series obtained from cinchonine and those got from tar; and (3) whether, and if so, how, both as regards extent and character, the physiological action of these bases differed from that of the original alkaloidal bodies. The bases in both series are difficult to separate from each other; but this has been done as far as possible by repeated fractional distillation. The salt employed was the hydrochlorate. This, dissolved in water, was introduced by a fine syringe under the skin of the animal. The action of chinoline was tested on frogs, mice, rabbits, guinea-pigs, cats, dogs, and man; but as the effects were found to be similar in all of these instances, the majority of these observations were made on rabbits. The experiments with the other substances were made on rabbits and frogs. The physiological action of hydrochlorate of chinoline was first examined. Its action was then compared with that of the hydrochlorates of the chinoline series of bases distilling at higher temperatures, including such as lepidine, dispoline, tetrahiroline, etc. In the next place, the physiological action of the pyridine series was studied, beginning with pyridine itself, and passing upwards to bases obtained at still higher boiling-points, such as picoline, lutidine, etc. Lastly, the investigation was directed to the action of condensed bases, such as dipyridine, parapicoline, etc.; and the effects of these

substances were compared with those produced by the members of the chinoline series and among themselves. The following are the general conclusions. 1. There is a marked gradation in extent of physiological action of the members of the pyridine series of bases, but it remains of the same kind. The lethal dose becomes reduced as we rise from the lower to the higher. 2. The higher members of the pyridine series resemble in physiological action the lower members of the chinoline series, except (1) that the former are more liable to cause death by asphyxia, and (2) that the lethal dose of the pyridines is less than one-half that of the chinolines. 3. In proceeding from the lower to the higher members of the chinoline series, the physiological action changes in character, inasmuch as the lower members appear to act chiefly on the sensory centres of the encephalon and the reflex centres of the cord, destroying the power of voluntary or reflex movement; while the higher act less on these centres, and chiefly on the motor centres, first, as irritants, causing violent convulsions, and at length producing complete paralysis. At the same time, while the reflex activity of the centres in the spinal cord appear to be inactive, they may be readily roused to action by strychnine. 4. On comparing the action of such compounds as $C_9H_7N$ (chinoline) with $C_9H_{13}N$ (parvoline, etc.), or $C_8H_{11}N$ (collidine) with $C_8H_{15}N$ (conia, from hemlock), or $C_{10}H_{10}N_2$ (dipyridine) with $C_{10}H_{14}N_2$ (nicotine, from tobacco), it is to be observed that the physiological activity of the substance is, apart from chemical structure, greatest in those bases containing the larger amount of hydrogen. 5. Those artificial bases which approximate the percentage composition of natural bases are much weaker physiologically, so far as can be estimated by amount of dose, than the natural bases; but the kind of action is the same in both cases. 6. When the bases of the pyridine series are doubled by condensation, producing dipyridine, parapicoline, etc., they not only become more active physiologically, but the action differs in kind from that of the simple bases, and resembles the action of natural bases or alkaloids having a similar chemical constitution. 7. All the substances examined in this research are remarkable for not possessing any specific paralytic action on the heart likely to cause syncope; but they destroy life either by exhaustive convulsions, or by gradual paralysis of the centres of respiration, thus causing asphyxia. 8. There is no appreciable immediate action on the sympathetic system of nerves. There is probably a secondary action; because, after large doses, the vaso-motor centre, in common with other centres, becomes involved. 9. There is no difference, so far as could be discovered, between the physiological action of bases obtained from cinchonine and those derived from tar. Dr. McKendrick also described the physiological effects of various methyl and ethyl compounds of chinoline. He alluded to the researches of Professor Crum Brown and Dr. Thomas R. Fraser on the action of methyl and ethyl strychnia as examples of a complete change in physiological action being produced by a change in chemical constitution. He and Professor Dewar had found the ethyl and methyl compounds of chinoline to have an action very different from chinoline alone. They were found to be much more active than chinoline alone, and to produce effects similar to those of the higher members of the chinoline series. He then indicated the important considerations suggested by this investigation; and said it was not too much to anticipate that the chemist may yet be able to build up compounds having effects resembling those of such valuable remedies as quinine, morphia, etc. Dr. Pye-Smith said it was gratifying to find that so important a branch of science was being investigated by two such eminent men as Dr. McKendrick and Professor Dewar. Some of the bases to which reference had been made would, no doubt, prove useful medically and physiologically, especially in the latter capacity. With regard to cinchonine, he had made some experiments with it on the human frame; and he was led to the conclusion that the further it was kept from patients the better it would be. It was certainly cheaper than quinine, but it had many objectionable characteristics. He was glad to hear of the promised advantages of chinoline, which, if realized, would help them out of the difficulties attending the administration of woorara to the mammalia.—*British Medical Journal*, Sept. 4, 1875.

13. *Quinia as a Gargle in Diphtheritic, Scarlatinal, and other forms of Sore Throat.*—Dr. DAVID J. BRAKENRIDGE observes (*The Practitioner*, Aug. 1875) that "the following facts, among others, may be regarded as established:—

"1. Quinine is a protoplasm poison, and limits the number and movements of the white blood corpuscles and pus cells.

"2. It prevents the pathological migration of the blood corpuscles into the tissues of the membranous and parenchymatous organs exposed to the air, both when it is given subcutaneously and when it is directly applied to the part.

"3. It restrains the dilatation of the bloodvessels.

"4. It is an antiseptic, and exerts a paralyzing, or, in larger doses, a destructive influence on microzymes.

"With these facts in view, the theoretical appropriateness of quinine as a gargle in diphtheria with abundant proliferation of micrococci, and in scarlatinal, and various other forms of sore throat, especially when attended with membranous exudation, pultaceous secretion, or ulceration, is apparent. For it antagonizes all the visible factors of such forms of inflammation.

"Before employing it for this purpose, I was familiar with the use of solution of quinine as a dressing in bed-sores and other tedious ulcers. The marked diminution in the secretion of pus and the rapid improvement which I observed to take place in these cases when so treated, first led me to anticipate good results from quinine as a gargle.

"For the last four months I have treated every suitable case of sore throat that I have met with in my wards in the Royal Infirmary and elsewhere, with a gargle composed, as a rule, of two grains of sulphate of quinine and five minims of dilute sulphuric acid to each ounce of water. Sometimes I have been able to increase the strength; sometimes I have been compelled to diminish it. When well tolerated, the stronger it is the better.

"The results I have obtained fully confirm my favourable anticipations. From a considerable number of cases I draw the following conclusions:—

"Simple non-syphilitic ulcers of the throat, under this treatment, at once assume a healthier aspect and heal rapidly.

"In syphilitic ulcers, the local treatment has always been accompanied by the internal administration of iodide of potassium, or some other suitable constitutional remedy; but my impression is that, in these cases, the cure is hastened by the quinine gargle.

"Its effect in the sore throat of scarlatina is very marked, the pultaceous secretion being checked, and the inflammatory swelling diminished.

"It is of comparative little use in the early stage of cynanche tonsillaris, over which tincture of aconite, in minim doses frequently repeated, has so decided a control. When, however, abscess followed by abundant discharge of pus results, its beneficial influence in checking the suppuration and promoting healing is marked.

"In the slighter forms of diphtheritic sore throat, it answers admirably, preventing the extension of the disease, and promoting the separation of the membranous exudation.

"It is, however, in severe cases of true diphtheria that I hope it will prove most useful. I have now employed it in three cases of this disease, and in all the result has been highly satisfactory."

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14. *Action of Mercury on the Liver.*—Sir ROBERT CHRISTISON, in his instructive presidential address before the British Medical Association at its meeting the present year, stated, that, "While deeply interested in, and much instructed by, the experiments performed by a Committee of this Association, regarding the use of mercury, for example, I remain as thoroughly convinced as ever that the much abused drug in question exerts a powerful action on the function of the liver, and is to be trusted as a most efficient remedy in controlling not a few of its disorders."—*Brit. Med. Journ.*, August 7, 1875.

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15. *Narcotism by the Products of Tissue Change after Fatigue.*—The fact that severe fatigue, either of the muscular or nervous system, predisposes to sleep, has led Dr. W. Preyer, of Jena, to make experiments with those sub-

stances which are most likely to be formed in the tissues after such exertion, especially lactic acid, to see whether they possess any narcotic properties. He finds, after a long series of observations and experiments, that lactate of soda, either subcutaneously injected in a concentrated aqueous solution, or else introduced into the empty stomach in large doses, frequently induces sleep if the subject of the experiment is kept quiet and undisturbed. There are, however, considerable individual differences in its effects both on animals and men, not only as to the time of onset of sleep, but also as to its duration and intensity. Young and small animals are affected more easily than old and large animals. Preyer finds that the exhibition of such liquids as are favourable to an abundant production of lactate of soda in the intestinal canal—*e. g.*, concentrated syrup, or copious draughts of sour milk and of whey—in many cases gives rise to drowsiness, and even actual sleep; and he thinks that this fact might be of practical application in some diseases where morphia and chloral are now exclusively ordered. Lactate of soda, in doses much larger than are required to induce sleep, increases the number of the respirations and also their depth; and reflex irritability and (in warm-blooded animals) the temperature are diminished. Dr. Preyer, from his experiments on animals, is strongly opposed to the use of the lactates of potash, magnesia, and lime for narcotic purposes in the human subject.—*Medical Times and Gazette*, Aug. 28, from *Centralblatt*, No. 35, August, 1875.

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16. *A Method of increasing the Solubility of Salicylic Acid.*—An objectionable property of the new antiseptic, and threatened rival of carbolic acid—salicylic acid—is its insolubility in cold water, so that it has been, till now, impossible to obtain a stronger solution of it than 1 part to 300; while the alcoholic solution and the pure acid are too irritating to be applied directly to a wound. Those, therefore, who are specially interested in comparing the antiseptic properties of the two acids, will be glad to know that the solubility of the latter is enormously increased by the addition of borax to the water, so that as much as ten parts of the acid can be dissolved in 100 parts of water, if eight parts of borax be present. This discovery we owe to Dr. H. Bose, assistant in the Surgical Clinic at Berlin, who has contributed a paper of much interest to the *Berliner Klinische Wochenschrift* (No. 28, July 12), to which we are indebted for the following details. The solution should be made by first dissolving the borax with the aid of heat, and then gradually adding the salicylic acid to the boiling fluid. Since commercial samples of both these drugs are not chemically pure, a small amount separates, and requires to be filtered off on cooling. The filtrate is a clear yellowish or light-brown fluid, according to its concentration. The proof that the addition of borax does not convert more than a part of the salicylic acid into salicylate of soda—a salt devoid of antiseptic properties—is easily shown; for if we dissolve 6.9 parts of the acid in 100 parts of boiling water, and then add 2.89 parts of bicarbonate of soda, the carbonic acid in the latter is set free, while the soda combines with the salicylic acid, and on cooling there is such an abundant deposition of the excessive acid that the whole liquid becomes nearly solid, owing to the formation of crystals. Now if the whole be reheated until the acid is completely dissolved, and then 3.58 parts of boracic acid added, no deposit of any kind occurs on cooling. The most suitable strength in which the above solution can be used for direct application to wounds, is, according to Dr. Bose's experience, one which contains from 2½ to 5 per cent. of salicylic acid, and 2 to 4 per cent. of borax. Solutions containing more than 5 per cent. of acid are too irritating, and give rise to a very abundant capillary hemorrhage if applied to the surface of a fresh wound. Dr. Bose speaks highly of the result obtained with the boro-salicylic dressing in a number of cases of removal of small tumours. The operations were all performed without the spray, and only the sponges and forceps used were cleansed antiseptically with the above solution. The wound was thoroughly washed with the same liquid, and then a thick layer of salicylic wadding, also soaked with it, was laid on its apposed edges, so as to reach several fingers' breadths beyond them, and fixed by means of a bandage; catgut was used to tie any vessels

requiring ligature. In those cases where the edges of the wound could not be accurately brought together, Dr. Bose put in catgut sutures, and then filled the spaces between the edges with the salicylic solution by means of a small syringe, and applied the wadding over all. The greater number of the cases thus treated healed by first intention, without the formation of a drop of pus. Dr. Bose concludes his paper by stating that he has as yet no experience of the value of the boro-salicylic acid solution in dressing *large* wounds, and that he has not found it invariably successful in the case of small ones, but he thinks that the frequency of small wounds in practice, the simplicity of the method, and the facility with which healing by first intention can be obtained by it, renders it worthy of a passing notice.—*Med. Times and Gazette*, July 24, 1875.

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## MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

17. *Subcutaneous Injections of Pure Water.*—Dr. LAFFITTE communicated a note to the French Association for the Advancement of Science on the employment of subcutaneous injections of pure water, and the relief to pain which has resulted therefrom in numerous affections. He asserts that they are as markedly efficacious as injections of morphia. He ascribes their calming effect to the compression of terminal nervous filaments by the injected water.—*L'Union Médicale*, Sept. 4, 1875, and *Revue Scientifique*, Aug. 28.

18. *Transfusion.*—Prof. PONFICK, of Rostock, finds that when the blood of a different species of animal is used in transfusion, serious effects follow, which often lead on to death. The red corpuscles of the dissimilar blood undergo disintegration in the vessels of the animal, and the hæmoglobin is set free. This is excreted by the kidneys, and so we have hæmoglobinuria. If a small quantity of blood is used, the kidneys are equal to the elimination of the hæmoglobin, but larger quantities lead to an inflammation of the kidneys, with the usual formation of tube casts and interference with the secretion of urine. If even similar blood is first frozen repeatedly, so as to destroy the corpuscles and set free the hæmoglobin, and then injected, it produces similar results. If dissimilar blood is transfused, therefore, as a therapeutic agent, it must be for the sake of the plasma and white corpuscles, and only in small quantities.—*Glasgow Med. Journal*, July, 1875, from *Virchow's Archiv*, Part III., Jan. 1875.

19. *Method of instantaneously arresting Palpitations of the Heart.*—Dr. J. LARDIER describes (*L'Union Medicale*, August 21st) a method by which he asserts that palpitations of the heart, not due to any material lesion of that organ or of the nervous centres, may be instantaneously arrested. He discovered this means accidentally, when troubled himself with palpitations. Since then he has directed many of his patients suffering from this trouble to bend their body, the head down, and the arms hanging so as to momentarily cause congestion of the upper part of the body. In all cases of nervous or anæmic palpitations the heart quickly resumed its normal action. He adds that if, while in the above-described position, respiration is arrested for a few seconds only, the relief afforded is still more speedy.

20. *Treatment of Acute Rheumatism by Tincture of Perchloride of Iron.*—Dr. J. RUSSELL REYNOLDS, of London, read a paper on this subject, at the late meeting of the British Medical Association (*British Med. Journal*, Aug. 21, 1875). He commenced by referring to the paper on the same subject, which he read at the meeting of the Association in 1869. He now, by the citation of a number of cases, showed how early relief had been afforded, not only from pain, but from the abnormal heat, by the use of the remedy referred to. Of the cases cited, 44 per cent. of first attacks were convalescent within

the first week, while of those in their second, third, or fourth attacks, 42 per cent. recovered within the same period.

Dr. CREIGHTON, of Tavistock, said he had been in the habit of treating cases of rheumatic fever with large doses of tincture of perchloride of iron, combined with liquor ammoniæ acetatis, and the results had been that the fever, which otherwise would not have been subdued within, say six weeks, had been reduced within ten days or a fortnight. At the same time, under that treatment he found that the amount of heart disease accompanying rheumatism had been very greatly reduced.

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21. *Treatment of Aneurism of the Arch of the Aorta by means of Galvano-Puncture.*—Dr. T. MCCALL ANDERSON read a paper on this subject at the recent meeting of the British Medical Association (*British Med. Journal*, August 21, 1875). After giving a report of two cases in which this treatment was carried out with success, Dr. Anderson laid down the following rules: 1. The continuous-current battery should always be employed, never the induction apparatus. 2. The kind of battery is of less consequence, if it be in good working order; but the cells should be large, so as to increase the chemical effect. 3. The needles should not be very thick, but very sharp, and should be oiled before being introduced, and that portion of them which traverses the skin, walls of the sac, and intervening tissues, should be insulated by means of a coating of vulcanite. 4. The needles should be connected with the positive pole of the battery. 5. A weak current of electricity should be used (from four to eight cells of a large Stöhrer's battery), and the operation may be continued for about an hour. 6. The number of operations, and the length of the intervals between each, must depend upon the effect of those which preceded them. Dr. Anderson concluded by referring to the dangers connected with the electrolytic treatment, viz., inflammation, and the entrance of air and of clots into the circulation; and observed that it was a question to which attention should be specially directed in the future, whether the consolidation of that portion of the aneurism which approaches the surface may not, in some cases at least, favour the extension of the disease in other directions, and lead to internal pressure-symptoms, and to rupture into internal organs. Dr. Clifford Allbutt (Leeds) stated, as the result of his experience, which was drawn from five or six cases, that the mode of treatment described by the author must be considered as successful. The points on which success depended he regarded as the use of a feeble current (five cells), with Ladd's galvanometer, derived from large plates, and the introduction of the positive pole only. It was well also to use several needles, all connected with the same pole. Strong currents were injurious, and small plates did not give so good results. Notwithstanding this, the author said, embolism must be regarded as a risk. It occurred the day following one of his operations, in which he had introduced both poles into the sac. Dr. Anderson, in replying, remarked that it must be remembered that, when embolism occurred after an operation, it did not necessarily follow that it was due to the mode of treatment.

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22. *Treatment of Acute Cerebral Rheumatism by Chloral Hydrate.*—M. RAYMOND communicated to the Biological Society of Paris (*Gazette Hebdom.*, No. 14, 1874), a case of cerebral rheumatism successfully treated by chloral hydrate; and M. Bouchut communicated to the French Academy of Sciences (May 3, 1875) three cases of the same disease equally successfully treated by the same drug. We have thus four cases of confirmed and severe cerebral rheumatism successfully treated by chloral hydrate.—*Gazette Hebdom.*, 11 June, 1875.

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23. *Hypodermic Injection of Chloral in Cholera.*—Surgeon A. B. HALL highly extols the efficacy of hypodermic injections of chloral in cholera, and adduces some strong testimony from others who have tried it as to the success attending this mode of treatment. Mr. H. attaches great importance to the strength of the solution used, which should be one part of chloral hydrate to ten of water. If stronger than this it may not be absorbed into the blood.

Of this solution of ten grains of the salt to one hundred minims of water, ten to twenty drops may be used at once—the former dose is generally sufficient—and be repeated.

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24. *Diabetes Insipidus treated beneficially by Jaborandi.*—Two cases of polydipsia treated by Prof. LAYCOCK with jaborandi, are reported (*Lancet*, Dec. 14) by his assistants. In both cases the amount of urine was largely decreased after the administration of jaborandi.

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25. *Nitrate of Soda in Dysentery.*—Dr. CASPARI recommends the nitrate of soda in large doses for the treatment of acute dysentery. This salt was largely employed by Rademacher, who asserted its superiority to all other antidysenterics. Caspari's experience is chiefly derived from the Frankfort Hospital, where 30 per cent. of the cases, in the autumn of 1871, consisted of acute dysentery. The remedy is as effectual in the rectal form of the disease as in the intestinal variety; when there is reason to believe that the small bowel is much involved, smaller doses ought to be given than when the inflammatory mischief is limited to the lower end of the large intestine. From three to six drachms of the salt may be administered in the course of twenty-four hours, in divided doses; the solution should always be given warm.—*London Medical Record*, August 16, from *Bulletin Général de Thérapeutique*, June 30, 1875.

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26. *Gelsemium Sempervirens in Neuralgia.*—This article, which has had reputation in this country for neuralgia, has attracted little attention in Europe. It has been recently tried at the Dispensary at Heidelberg by Dr. JURASZ, Ass. Phys., who has reported favourable results. Five minims of the tincture were given three times a day for three days to a man æt. 30, who had been suffering for a week with neuralgia of the right supra-orbital nerve, which had resisted quinia and veratria treatment, and completely cured him. The same dose given for six days gave permanent relief to a woman who had had brachial neuralgia on the left side for more than a year and a half, and been treated with various other remedies without success. Two other neuralgias of the fifth nerve were rapidly cured with five and ten-minim doses; and a case of very severe sciatica on the right side in a man of sixty, which had completely disabled him and confined him to bed, was quickly relieved by eight-minim doses three times a day, and the patient was able in a fortnight to walk with a stick; the cure being completed by warm baths and the use of the constant current. On the other hand, the gelsemium failed completely in two cases of muscular rheumatism, and in a case of long-standing hemicrania.

In no instance was any unpleasant effect observed, either on the circulatory or digestive organs; but the dose of twenty minims was never exceeded.—*Med. Times and Gaz.*, Aug. 14, from *Centralblatt*, July 10, 1875.

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27. *Tracheotomy in Croup and Diphtheria.*—Dr. GEO. BUCHANAN, Professor of Clinical Surgery in University of Glasgow, makes (*Brit. Med. Journ*, Sept. 4, 1875) some interesting remarks on tracheotomy in croup and diphtheria. These diseases, he says, "but especially diphtheria, when they prove fatal, cause death in one of two ways: either by exhaustion or by suffocation. Hence, we may say there are two varieties, viz., the asthenic and sthenic. In the great majority of instances, croup is a sthenic inflammation attended with effusion of lymph in the trachea, and proves fatal by suffocation. In some cases, however, the attack is attended with such a depression of the vital powers that the patient sinks apparently from the virulence of the disease. This, however, is a rare case. But in diphtheria there are two well-marked types: the sthenic, which closely resembles an attack of sthenic croup, except that the effusion of lymph begins on the fauces and extends through the glottis into the trachea; and the asthenic, which more closely resembles scarlet fever, and in which the effusion covers the whole of the mucous membrane of the fauces, tonsils, and even the pharynx, and in which the false membrane soon becomes foul, putrid, ichorous, and contagious.

"In the former of these types, the danger is suffocation; in the latter, it is vital depression, death from asthenia."

When medical treatment has been fairly tried, and when it is proving unavailing, and when death seems imminent from suffocation, not from vital depression or exhaustion, Dr. B. thinks it is the duty of the medical attendant to perform or advise the performance of tracheotomy. Last December, he says, "I was called to a case of croup, and when I arrived I found the child, a girl seven years of age, in the last stage of suffocation. The two medical gentlemen in attendance declared that the patient was beyond the reach of surgery. One of them, who had never seen the operation, strongly dissuaded me from making the attempt; the other, who had at one time been one of my clinical students, on hearing my wish to give the child a chance, persuaded the parents to consent. The little patient was livid, and though I did not use chloroform, as I usually do, it did not wince when I made the incision through the skin. The result was that the child is now alive, and in the enjoyment of excellent health.

"To one who sees the operation for the first time, the hopelessness as to the attempt is only equalled by the surprise and gratification at the result.

"But, while I am so strongly advocating the operation in the circumstances referred to, there is one condition in the suffocative form of those diseases which contraindicates tracheotomy, and which, if discovered, should prevent any one from performing it. When the suffocation depends not only on obstruction of the trachea, but also on effusion of false membrane or the glutinous fluid which precedes it, into the smaller bronchial tubes, then the case is not one for operation. The difficulty, then, is to discover when the false membrane which causes the obstruction to breathing is limited to the trachea and larynx and when it has invaded the bronchia. Percussion and auscultation ought to assist in the diagnosis, but the restless tossing of the child and the noise of the breathing always make this a difficult proceeding.

"There are two signs which appear to me to be valuable guides: one is the amount and loudness of the stridor, which is always great in proportion to the patency of the small tubes and obstruction in the trachea.

"But the most valuable test is a view of the naked chest. When the obstruction is in the trachea, while the bronchial tubes are free, the respiratory movements are continued with exaggerated energy, but the chest will not respond to the muscular efforts. The result is that at each inspiration the flexible parts of the thoracic walls are drawn in with great force, the intercostal spaces are hollowed, and the ensiform cartilage sucked back. But when the small bronchial tubes, and, perhaps, the air-cells, are stopped with the viscid or membranous effusion, the muscular efforts are more feeble and the chest remains puffed out, and the whole aspect is that of a child thirsting for breath, but with the lungs already full and themselves unfit for respiration. In this latter case, I never operate; in the former, with every hope of success."

Dr. B. gives a table of 46 cases of tracheotomy, of which 17 were cured and 29 died. "Tracheotomy in Croup, 16. Cured 6; Died 10. Tracheotomy in Diphtheria, 30. Cured 11; Died 19.

"The average result is precisely the same, viz., one child is saved out of every two and two-thirds operated on; and, as the operation was always done when there seemed no hope of recovery otherwise, it may safely be stated that the lives of these seventeen children were saved by tracheotomy."

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28. *Diphtheritic Croup; Tracheotomy; Artificial Respiration; Recovery.*—Dr. B. W. Richardson reported in the *Med. Times and Gazette* (August 2, 1873), a case in which respiration carried out with the double-acting bellows led to the restoration of natural breathing five successive times, and prolonged life for thirty hours, though the patient ultimately succumbed. In the number of the same journal for July 17, 1875, he reports a second case in which the same treatment was crowned with complete success.

The subject of it was a boy five years of age, to whom Dr. R. was called in consultation March 1. The child was suffering from diphtheritic croup, and breathing with so much difficulty that suffocation seemed imminent. He was

restless, at times slightly convulsed, lips blue, and body becoming cold. "The breathing was so noisily shrill, from the narrowing of the larynx, that we had some difficulty in making a correct diagnosis of the condition of the heart, but in a brief interval of quiet I detected that both sounds of the heart were clear, and that there was no obvious indication of obstruction to the course of blood through the right side of the heart, from separation of fibrin." Dr. Wilbe administered bichloride of methylene, which produced rapid and gentle anæsthesia, when Dr. Richardson opened the trachea as low down as he could conveniently, experiencing no difficulty except from a little excess of bleeding from the divided surface of an unusually large thyroid gland. So soon as the opening was made into the trachea, there was sharp expulsion of air from the lungs, together with extrusion of a portion of false membrane. This over, he introduced the outer blades of Fuller's tracheotomy-tube, and through them the inner tube. The child was now allowed to recover from the anæsthesia, the tube being neatly and firmly tied in position. Free breathing through the tube was soon established, and the return to consciousness, from the anæsthesia, was attended by favourable symptoms. The heaving of the chest ceased, the face lost its lividity, and the surface of the body became warm.

The operation was performed at 10.30 P. M., and at 11.5 he was put to bed and fell into a short sleep. To prevent, as far as possible, the danger of death from asphyxia every available means was provided for clearing the tracheal tube, and for changing it if required, and competent assistants provided to watch the patient.

*March* 2. Patient had slept during the night with only two interruptions. He had fed himself with two teacupfuls of milk. He was breathing comfortably through the tube, his body was of natural warmth, and the asphyxia had entirely disappeared. He passed through this day favourably.

3*d*. At 1 o'clock A. M. the breathing became embarrassed, owing to plugging-up of the tube, and as the tube could not be cleared in position, Mr. Lovell was obliged to remove the inner tube. It was nearly choked with a compact mass of secretion, which adhered with great firmness. The patient now breathed easily through the outer blades of the tube, and they therefore were left simply in place. In a few hours the breathing again became embarrassed; at 3 P. M. the tracheal opening was plugged, and the patient was asphyxiated. The blades were promptly removed, and a portion of the membrane was expelled. He now for a short interval breathed through the wound, and then ceased to breathe altogether, and to common observation appeared to be dead. At this juncture Dr. Wilbe and Mr. Lovell, who happily were present, passed the elastic tube of the double-acting bellows into the wound, and set up artificial respiration. The artificial respiration brought back animation in a few minutes, and natural inspiration followed; but the artificial process had to be repeated, at times, during a quarter of an hour before independent breathing was fully re-established.

After the natural respiration was completely restored, the outer blades and inner tube were reintroduced into the trachea. The breathing continued easy during the rest of the day.

On Thursday, March 4, at 3 A. M., the breathing having once more become laborious, the tracheal tube was cleared with a feather, after which, for several hours, the breathing remained free. In the afternoon the blocking-up again occurred, and at 4.30 P. M., at a consultation at which we were all present, it was agreed to remove the metal tube, and to introduce a larger-sized vulcanite tube. As the new tube was being inserted, some false membrane was coughed through it. The patient continued to breathe easily through the vulcanite tube until 11 P. M., when some temporary obstruction occurred, and the respiration was for a little time laboured. In the course of this day the child ate a little beef finely minced, and some small pieces of orange; at intervals he took a teacupful of milk.

On the three following days the breathing at times became difficult, so that it was necessary to remove the tube and replace it with a larger vulcanite one, and portions of diphtheritic membrane were discharged.

8*th*. The tube was removed, and was replaced by a clean one at 8.15 A. M.

In the afternoon of the same day, after visiting the patient with Dr. Wilbe, we found the breathing sufficiently free when the vulcanite tube was out of the trachea to warrant the suggestion that the wound should be left simply open. The patient was now fairly convalescent.

From this time recovery took place rapidly. There was a slight paralysis of the glottis, and for a day or two, when the patient swallowed milk, a little of it flowed into the trachea, and escaped by the wound. But this difficulty soon passed away. The external opening healed up soundly, and in a few weeks I had the pleasure of making a friendly call, with Dr. Wilbe, to find the boy restored to perfect health.

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29. *Chloral in Sea-sickness.*—Dr. Obet states, that, of all the numerous remedies he has tried for sea-sickness, chloral, recently recommended by M. Giraldès, is by far the best, and is indeed very efficacious. Bromide of potassium, which, before the introduction of chloral, was the substance that did most good, is far too slow in its effects, and requires to be given in too large doses before any marked effect is produced, while the quantity of water necessary to enable it to be swallowed forms a serious obstacle to its employment in this affection. Chloral, on the contrary, given in the form of syrup, in a dose of from 1 to 1½ or 2 grammes, procures a calm and tranquil sleep, on awakening from which the patient finds himself, if not completely cured, at least in a state of relative comfort. On the first day of the voyage, this sleep should be at once secured by giving the patient 1 gramme (15 grains) at a single dose, and the following days 1½ or 2 grammes may be given during the day, by taking a spoonful of the syrup every hour. As a general rule, under this plan, in two or three days the sick passengers have become accustomed to the sea, and are even able to take their meals at the table. The chloral, to be useful, must always be free from all alteration, and from the action of humidity. When it has not been kept in a very dry place, so that it has become somewhat deliquescent, in place of the calm sleep so much desired, it may produce nervous irritation, sometimes of great violence. In pregnant women, several of whom the author has had in charge, this medicine also furnishes excellent results. He has not found voyaging by sea exercise any effect upon the progress of pregnancy, even violent sea-sickness not having induced either hemorrhage or premature labour. Still, voyages exert a special effect on the uterus, for under their influence there is always produced a premature return of the menses, and, in feeble women, the discharge may be sufficiently great to call for medical intervention. Constipation, which is the usual accompaniment of sea-voyages, should be most carefully obviated in the subjects of sea-sickness. Moral treatment, too, especially for women, is of great consequence, for no one can be more demoralized than the subject of sea-sickness. Chloral acts here admirably, by reason of the refreshing sleep which it procures; and the presence of the medical man greatly encourages the patient in his efforts against the state of depression that prevails. He should be encouraged, whenever possible, to come on deck to inhale the fresh air and escape the abominable smells of the cabin. The subjects of sea-sickness usually complain of insatiable thirst, and many take an immense number of lumps of ice to relieve it, but at the end of thirty-six or forty-eight hours this immoderate use of it gives rise to violent irritation of the stomach, to which is added the sensation of a hot iron passed along the œsophagus. Others prefer iced lemonade, of which they drink glass after glass, rejecting it by vomiting immediately afterwards. Brandy or whiskey is the favourite drink among the American passengers. But of all such liquids iced champagne is the best, taken in tablespoonfuls every ten or fifteen minutes. In these small quantities it is easily borne, and acts beneficially. With respect to food, the patient should be left much to his own tastes—under-done and broiled meat being, however, preferable when he can eat such. He should not be restricted to fixed hours of meals; and although on the boats the table is served five times a day, the intervals are still too long for him. It is preferable to follow Dr. Brown-Séquard's mode of treating dyspepsia with obstinate vomiting, the patient taking every quarter or half-hour one or two mouthfuls of bread and meat, or other food, with a little

iced champagne.—*Med. Times and Gaz.*, July 31, from *Archiv. de Med. Navale*, June, 1875.

30. *Collodion in Erysipelas.*—In allusion to a recently published case, in which M. Broca arrested the advance of erysipelas by surrounding the eruption with flexible collodion, applied over a breadth of six or eight centimetres all around its margin, Dr. LUBAUSKI, of Nice, writes to say that this is a practice which he has pursued with invariable success during the last thirty years—ever since, in fact, M. R. Latour introduced the medical employment of collodion. The great point is to immediately repair any breaches that may be made in the collodion circle. He has also applied collodion with great advantage to the eruption in a case of zona.—*Med. Times and Gaz.*, July 31, 1875, from *Union Méd.*, July 20.

31. *Treatment of a Common Cold.*—Dr. J. MILNER FOTHERGILL offers (*The Practioner*, July, 1875) some instructive remarks on this subject. Colds he states are always "the consequences of a chill, either to the general surface or to a portion of it. Ordinarily the body temperature is maintained by the equilibrium existing betwixt the internal heat-producing area and the external heat-losing area—the surface—according to Rosenthal. When excessive heat-loss is not met by increased heat-production, a chill or lowering of the body temperature is the consequence; or if heat-production has been great, as in a ball-room, for instance, the cutaneous vessels are dilated, and if the surface be suddenly exposed to cold these dilated vessels are apt to be paralyzed instead of incited to contract, and then heat is rapidly lost from the mass of warm blood in the cutaneous vessels. The catching cold, or the escape from doing so, depends upon the state of the vessels of the surface and their capacity to contract or the opposite. Consequently we can see that catching cold or escaping it under apparently identical circumstances depends upon a condition far removed from either vision or sensation. That the *modus operandi* of catching cold under these circumstances has afforded opportunity for difference of opinion, can be no matter for surprise. Rosenthal, however, has scientifically investigated the matter and unravelled the mystery. Where heat-loss is met by heat-production at the time, no unpleasant consequences result; but when the heat-regulating processes are delayed, the loss of heat and fall of temperature at the time are followed by an excessive heat-production, constituting a pyretic condition. This in its simplest form is recognized as a cold. Usually it is accompanied by some disturbance of the respiratory tract, either in the turbinated bones, known as nasal catarrh, as sore-throat, or as an attack of bronchitis. Of course these local inflammations may become very severe, and in bronchitis life is commonly threatened. There is at this point great vascularity of the internal heat-producing area, and a dry skin, whose heat-losing power is impaired from the loss of the aid of perspiration: for Leyden found that even the insensible perspiration is lost in increasing fever.

"What are the indications furnished to us for the treatment of this state of matters? Obviously to restore the balance betwixt the two heat-producing and heat-losing areas; and in order to do so we resort to such measures as shall increase the amount of blood in the outer area, and so diminish the amount in the internal area; that is, to increase heat-loss and lessen heat-production.

"The measures ordinarily resorted to for such ends are hot fluids, a warm bed, and often a dose of opium in some form. The result of such combination is the induction of perspiration, especially if the patient lie in bed next morning and have more hot fluids: for perspiration is most successfully induced from seven to nine in the morning. If the cold be caught at once by such measures the impending pyrexia may be averted, and the temperature equilibrium be maintained. More commonly, however, the case is more advanced when seen, and the pyrexia is clearly established. Under these circumstances the treatment will be more prolonged, and restoration of the heat-balance will not be so readily attained. The condition of increased vascularity of the heat-producing area with arrested action of the skin is to be met by the administration

of agents which possess the combined properties of lowering the heart's action and relaxing the vessels of the skin; or, in other words, which relax the two muscular ends of the circulation, the central and the peripheral. The impression so made produces a diminution in the blood-current and a dilatation of the vessels of the heat-losing area. As a consequence of this there is less blood in the internal area and less heat-production, with cutaneous vascularity and increased heat-loss; rarely, however, is an impression made upon the pyrexia until the action of the skin is excited and the cooling effects of exhalation attained. The administration of nauseant diaphoretics to attain these ends has been the rule amidst practitioners and housewives. The time-honoured antimonial wine has scarcely yet yielded to its rival ipecacuan, nor, perhaps, is it desirable that it should. Their combination is good, and to be recommended. In adults, iodide of potassium in guaiac mixture forms an excellent combination especially when the cold is combined with rheumatic pains, or tonsillitis. These internal remedies may be aided in their action by external measures, such as warm baths. With children it is easy to wrap them up in a blanket wrung out of hot water, to inclose them so wrapped in a dry blanket, and put them into bed. This may be repeated as required, and sufficiently aids the remedies given by the mouth. Measures for giving adults a warm bath in bed are now to be procured at little cost. After perspiration is once induced there is usually a gradual fall of temperature; but the normal may not be reached for some days. There is a decided tendency to excessive heat-loss after the action of the skin has been established, even though the temperature indoors be above the normal. Experience has taught humanity to wrap up well when passing through a cold, especially when it is breaking. Ere the action of the skin is re-established, the impression of external cold is grateful, but afterwards chills are readily experienced. The increase of blood in the heat-losing area permits of rapid heat-loss. When a cold is caught during the restorative period, it is usually a fixed one, and not rarely serious illness is the consequence.

"When the action of the skin is re-established, it not uncommonly happens that perspiration is profuse, even while the patients are wrapped up well to shield themselves from heat-loss. This is a troublesome stage in the history of a cold. Here mineral acids with vegetable tonics are indicated, and, perhaps best of all, dilute phosphoric acid in cascarilla or cinchona. In the treatment of influenza, vegetable acids along with a bitter tonic often produce a decidedly good effect. In addition to the general effect of the tonic, the arrest of the excessive activity of the sudoriparous glands is desirable. This stage is sometimes a prolonged one, and the maintenance of a pyretic condition by the rapid loss of heat and then increased heat-production is not an uncommon event. If this condition be pronounced, the best line of treatment is that of quinia with an astringent mineral acid. Quinia is well known to possess an apyretic action, probably to some extent by its effects upon the nerve-centres, and more, according to the observations of Binz, upon its checking the ozonizing action of the blood. The effect of the astringent mineral acid upon the skin is to check secretion, and by these combined measures a satisfactory restoration to the ordinary state of health is induced.

"In the treatment of the bronchial affections which so commonly accompany an ordinary cold, it is not a matter of indifference what expectorant remedy is selected. As long as the skin is dry and the bronchial lining membrane tumid and secretion arrested, ipecacuan with acetate of ammonia is indicated: or a little antimony may be added with advantage. When the skin is once thrown into action and the bronchial secretion also established, then acids with syrup of squills are suitable measures. But it is not a successful plan to administer squill with acids until the skin is moist. When there is a tendency to the free action of the skin, this latter combination in full doses is a useful plan of treatment. Neither is the union of carbonate of ammonia and senega in severe cases indicated until the secretion alike of the skin and the bronchial lining membrane is thoroughly established.

"The treatment of a cold consists really in hastening and abbreviating the ordinary processes by which a rude disturbance of the temperature-balance of

the body is recovered from. In order to do this a fair comprehension of the natural processes must exist, so that the remedial measures may harmonize with, and not contradict these natural processes."

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32. *Scarlatinal Anasarca and its Treatment.*—Dr. J. P. BRAMWELL states (*Edinburgh Medical Journal*, July, 1875) that in the last two epidemics of scarlatina which occurred in Perth, one in 1868, the other in 1874, he treated thirty-two cases of acute scarlatinal dropsy with but two deaths. "One of the fatal cases was seen too late, when no depletion could be thought of. This patient died of acute pulmonary œdema. From the severity of not a few of these cases, and the inadequacy of other means in a considerable proportion of them, there is no doubt in my mind but that several more of them would have terminated fatally had bloodletting not been boldly employed. Let me venture, then, to press this valuable old remedy in this disorder upon the notice of my professional brethren who may not have tried it, especially on the rising generation of physicians, who have been educated, perhaps, too exclusively in an expectant or building-up treatment."

The treatment adopted by Dr. B. was as follows: "When the case was one of moderate severity, and the uræmic symptoms not a conspicuous feature, sharp purgation with drastics, such as the comp. jalap, or comp. scammony powders, answers very well. It was found, however, that a very large dose was required to produce the desired effect, ʒss or even ℈ij of comp. jalap being often required for a child five or six years old. This purgation was alternated by vapour-baths, and at a later period, when febrile action was diminished, inf. of digitalis with acet. of potash was administered with good results. It will be found, however, that dropsical symptoms in the majority of such cases will persist in spite of all these means, and go on from bad to worse till alarming pulmonary complications show themselves, or convulsions supervene. What now is to be our line of procedure? We venture to affirm, that at this juncture abstraction of blood, either general or local—certainly general when there are convulsions—will act in a most beneficial manner, and convert in a short time an apparently hopeless case into a remediable one. In order to accomplish this, however, we must not hesitate to take blood freely, as ten ounces from the arm of a boy ten years of age, or four ounces by cupping over the loins in a child four or five years of age. Neither must we be deterred from this by the supposed anæmic condition which some writers on renal disorders have ascribed to such patients. The truth is, they are not anæmic at all, but are suffering from an acute disorder associated with a very different condition of blood from that existing in chronic renal disorders, and the rapidity with which they recover after sharp antiphlogistic treatment sufficiently shows this. Depletion acts like a charm in convulsions from acute uræmia, and we have seen a free diuresis set up in forty-eight hours after its employment, unaided by any other remedies."

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33. *Pneumonia.*—Dr. THOMAS BARR, in an interesting article on this disease (*Glasgow Med. Journal*, July, 1875), based on sixty-four cases in private practice, gives the following as the treatment he adopted:—

1st. I have never employed general blood-letting, and, with the exception of the man who died from gangrene of the lung, I have never used even leeches. I think few of my readers will consider that in my cases of death the fatal result would have been prevented by depletion.

2d. I have in a few employed antimony in what might be called antiphlogistic doses. I generally used it for its expectorant and diaphoretic effects, and have very rarely used it at all with children under five years of age. I very often find patients suffering from the disease, with an irritable stomach, perspiring skin, and soft pulse. In strong adults, with very acute symptoms, and none of these contraindicating signs, I have used it in full doses with great advantage.

3d. Mercury. I have not used this medicine at all, unless as a simple aperient.

4th. Opium. I think I have seen more good done by this drug than by any

other single remedy. It gave comfort to the patient, relieving pain and allaying cough.

5th. Diaphoretics and expectorants have been given with advantage. These classes of remedies also include small doses of opium and tartar emetic.

6th. External applications. At early stages I have found most comfort from poultices of linseed meal and mustard, frequently repeated; while blisters were reserved for the more chronic stages, when the condensation of lung seemed to linger longer than usual.

With respect to the treatment of the children in whom the most of my fatal cases occurred; with the belief which I entertain of the real cause of danger, I have only adopted the restorative treatment. I have altogether eschewed bleeding, antimony, mercury. I have, of course, carefully confined the patient to a well-ventilated apartment (he requires all obtainable oxygen), with a comfortably warm temperature, given liquid diet, milk being the staple. If an infant at the breast, I limited its supply of breast-milk, and rather relieved its thirst by administration of cold barley-water; in the way of medicine, giving a diaphoretic mixture, small doses of ipecac. wine, sweet spirits of nitre, tincture of hyoscyamus, and solution of acetate of ammonia. Good has been done by allowing boiling water to evaporate near patient. Repeated linseed-meal and mustard poultices to back and front of chest have often done great good. As night approaches, the little patient often becomes very restless, annoyed by a constant hacking cough. Then I have often found the greatest benefit from a dose of Dover's powder, preferring to give one single full dose at night to small ones frequently repeated. Of course, if the case is complicated, with pent-up secretions in the air-tubes, I have avoided the Dover's powder. When the child is feeble, great benefit is derived from liniments to the chest, while beef-tea and brandy were often absolutely necessary to uphold strength till the patient passed through the crisis of the disease.

He states that "when one reads the statistics of hospital writers respecting this disease which have of late years been published, it requires not a little courage for a private practitioner to announce that he has had a mortality of one in six. But, supposing I selected my cases, and gave those only between the ages of six and fifty years, the ratio of deaths would be one in twenty-one, while of the forty-two cases between five and sixty-two, only two deaths took place."

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34. *A Study of Tubercle.*—This is the title of an interesting historical and experimental thesis by Dr. David Foulis (*Glasgow Med. Journal*, July, 1875), on the nature and source of tubercle. As the result of the present state of the inquiry, he states that "tubercle is the result of a local inflammation set up in certain cells of deranged vitality by irritation, either from solid particles, or from fluids of a composition unsuited to them. For a reason not yet quite made out, the usual vascularization of the product is not gone on with, and, therefore, while a tubercle may, and often does, become absorbed, it in most instances fails to receive an adequate supply of nutriment from the blood, and undergoes disorganization. That there is any 'inherent tendency' in the tubercle to disorganize we may safely and decidedly deny."

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35. *Artificial Diabetes.*—A paper was read by F. W. Pavy, M.D., at the Royal Society, on June 17, "On the Production of Glycosuria by the Effect of Oxygenated Blood on the Liver." The author referred to a former communication to the Society, on "Lesions of the Nervous System producing Diabetes" (*Proceedings of the Royal Society*, vol. x., 1859–60), in which he made known that division of certain parts of the sympathetic system occasioned the presence of sugar in the urine. The results given in that paper showed that there were other means, besides Bernard's celebrated experiment of puncturing the floor of the fourth ventricle, by which artificial diabetes could be induced, but they did not explain the reason of the appearance of the sugar, and the author still sought to discover something upon this point. The inquiry was pushed in various directions, but always with a fruitless issue until the summer of 1874. The author for some time past had been led to look to an altered condition of

the blood flowing to the liver as likely to prove the most probable cause of the transformation of amyloid substance into sugar, which evidently constitutes the foundation of the artificial diabetes following operations on the nervous system. Schiff is of this view, and (*Journal de l'Anatomie et de la Physiologie*, Paris, 1866) has referred the escape of sugar from the liver, and thence the production of glycosuria, to the development of a ferment in the blood as a result of the hyperæmia (not necessarily of the liver) which follows the operations on the nervous system which occasion artificial diabetes; but, although the author has carefully examined this opinion, he cannot obtain evidence of the development of a ferment in the manner asserted. He has further tried the effect of introducing a secretion—viz., saliva—into the circulatory system, which is known to act as an energetic ferment upon the amyloid substance of the liver; and on one occasion he found that, from some cause or other, the urine became to a moderate extent saccharine, but in a large number of other experiments the operation was attended with a negative result. Having so far proceeded without success, it occurred to the author to try the effect of introducing defibrinated arterial blood into the portal system. He was led to experiment in this way from having some time previously observed that when arterial blood only was allowed to flow through the liver—as, for instance, when the portal vein was tied and the hepatic artery left free—sugar escaped from the organ to such an extent as to render the contents of the circulatory system strongly saccharine. This result he had commented upon as being somewhat surprising, and as furnishing evidence standing in opposition to Bernard's glycogenic theory. He had not succeeded by the operation in producing glycosuria, because, as it appeared to him, no urine was secreted, owing to the ligature of the portal vein leading to such a diversion of blood from the general circulation, by the accumulation occurring in the portal system, that the flow through the kidney was too slight to allow of it. He had endeavoured to overcome this obstacle by connecting, through the medium of a canula, the portal with the right renal vein after ligaturing the corresponding renal artery. If the experiment had succeeded, the liver would have been left with its arterial supply, but the portal stream would have been diverted, and made to reach the inferior cava without traversing the hepatic vessels. As regards the operative part, this the author found he could accomplish, but each time he performed the experiment the object he had in view was frustrated by the canula becoming quickly filled with a plug of blood-clot. It was whilst under this difficulty that the thought of collecting blood from an artery, defibrinating it, and then introducing it into the portal system, occurred to him. He had considered it possible that some slight effect might be perceptible, but had not anticipated the strongly marked result which is producible. The amount of blood used has been from ten to eighteen fluidounces. After the production of anæsthesia by chloroform, the blood was collected from the carotid artery, stirred in order to defibrinate it, strained, and then very slowly injected into a branch of the mesenteric vein. In one experiment, where half an hour had been occupied in making the injection, the urine at the completion of the operation contained a notable amount of sugar, and half an hour later showed by analysis the presence of fifteen grains to the fluidounce. In a second, the urine contained ten, and in a third, fourteen grains to the fluidounce when collected three-quarters of an hour after the operation. The experiments were performed upon dogs, and in each case it had been ascertained that the urine was devoid of sugar before the operation.

Having noticed the effect which has been described from the injection of oxygenated blood into the portal system, it became necessary to ascertain positively that it was attributable to the oxygenated condition of the blood, and not to any other cause. To decide this point an appeal to the counterpart experiment was made. Defibrinated venous instead of arterial blood was injected into a branch of the mesenteric vein, and upon each occasion where such an operation has been performed a negative result has been obtained. With the evidence thus furnished, the conclusion may be warrantably drawn that oxygenated blood in some manner influences the liver, so as to lead to the production of glycosuria. It may be inferred that, contrary to the effect

of venous blood, it promotes the transformation of amyloid substance into sugar.

The suggestion naturally occurs that what has been stated above affords an explanation of the glycosuria occurring after Bernard's puncture of the fourth ventricle, and the various lesions of the sympathetic. Without any new agent being called in, sufficient is presented in the state of the blood to account for the production of sugar that occurs. By a vaso-motor paralysis affecting the vessels of the chylopoietic viscera, the blood will reach the portal system, without having become de-arterialized, in its natural way; and in this state it has been shown by the experiments narrated to possess the property of acting within the liver in such a manner as to determine the production of glycosuria. —*Med. Times and Gaz.*, July 31, 1875.

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36. *Diagnosis of the Position of the Lesion in Facial Paralysis.*—Dr. W. Erb gives some extremely useful hints for determining the exact seat of the lesion of the nerve in any particular case, which we reproduce here for the benefit of our readers. His method depends on observing whether certain special branches of the facial nerve are affected or not simultaneously with those supplying the muscles of expression: 1. If the posterior auricular nerve is involved, the lesion is inside the canal of Fallopius. 2. If the sense of taste is diminished or destroyed on the corresponding side of the anterior portion of the tongue, the lesion is above the point where the chorda tympani leaves the facial nerve. 3. If the sense of hearing is abnormally acute for low notes and also for distinguishing small variations in musical tones, the nerve to the stapedius muscle, which is given off above the chorda tympani, is implicated. 4. If paralysis of the soft palate can be detected, we may conclude that the lesion involves the trunk of the facial from the geniculate ganglion onwards towards the brain. The application of these rules to a large number of cases has proved, according to Erb, that in the majority of instances of rheumatic facial paralysis the seat of the lesion is lower than the point of origin of the chorda tympani, and that in the mildest forms only that part of the nerve is affected which lies outside the canal of Fallopius; for, being thus surrounded with loose tissue, it cannot be seriously compressed by the swelling of the neurilemma.—*Med. Times and Gazette*, September 4, 1875, from *Deutches Archiv für Klin. Medicin*, xv. s. 6.

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37. *Diagnosis of Enlarged Bronchial Glands in Children.*—Dr. Eustace Smith observes (*Lancet*, Aug. 14) that enlargement of the bronchial glands is a very common lesion in early life. "The seat of the enlarged glands is at the bifurcation of the trachea, and therefore behind the first bone of the sternum, and a little below it. They give rise to dulness on percussion at this spot, and the dulness often extends to each side of the bone, and also downwards to the upper part of the second bone. In the case of young children there is sometimes in health a little dulness on percussing the upper bone of the sternum, produced by the underlying thymus gland; but the dulness does not in such cases reach laterally beyond the limits of the manubrium. In the case of great enlargement of the bronchial glands there may be dulness also behind in the intrascapular region; but this is rare, on account of the thickness of lung which intervenes between the glands and the posterior wall of the thorax.

"The symptoms by which enlargement of the bronchial glands can be distinguished, viz., distension of the cervical veins, swelling of the neck, dyspnœa, spasmodic cough, and whispering voice, are all pressure signs due to the encroachment of the swollen body upon the parts around. They are, therefore, not present until the increase in size of the glands has become considerable. In these cases the dulness on percussion is usually marked, and if the glands are of sufficient size to compress the trunks of the large vessels, the ordinary stethoscopic signs of such pressure will be heard. At this stage the nature of the case is obvious; but at an earlier period, and before the enlargement has become sufficiently great to give rise to the signs enumerated above, the diagnosis of the lesion is much less easy, as the symptoms by which it is accomplished are few and obscure. At this time much assistance can be gained

from the following experiment. If the child be made to bend back the head so that his face becomes almost horizontal and the eyes look straight upwards at the ceiling above him, a venous hum, varying in intensity according to the size of the diseased glands, is heard with the stethoscope placed upon the upper bone of the sternum. As the chin is now slowly depressed, the hum becomes less loudly audible, and ceases some time before the head is brought back again into the ordinary position. The explanation of this phenomenon I believe to be that the bending backwards of the head throws forward the lower end of the trachea, which carries with it the glands lying in its bifurcation, and the left innominate vein, as it passes transversely behind the first bone of the sternum, is compressed between the enlarged glands and the bone. In cases where this sign has been present, there has often been some slight dulness ever the manubrium, leading one to suspect the existence of enlargement of the glands, and the occurrence of the hum thus produced I now always consider to be evidence confirmatory of the suspicion. The experiment does not succeed in cases of flat chest, where there is no reason to suspect glandular enlargement, nor can the hum be produced by the thymus gland in a healthy child. This gland lies immediately behind the sternum in front of the great vessels; enlarged bronchial glands lie behind the vessels in the bifurcation of the trachea. A swelling in front of the vessels does not appear to set up pressure upon the vein when the head is bent back in the position described. I have examined many children, with a view to test this point, and in no case have I found the characteristic hum produced except in cases where there was reason, from other symptoms, to suspect the presence of bronchial glandular enlargement."

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38. *Recovery from Intussusception after the Separation and Voidance of Four Inches of Small Intestine.*—Dr. RINTELN, of Oeynhausen, reports the following interesting case under the heading of "Gleanings from Practice," in the *Berliner Klinische Wochenschrift* for May 24, 1875. The patient, a delicate and spare woman, aged sixty, actually lived ten years after her recovery, and enjoyed fair health. The attack was preceded by diarrhœa and colicky pains. Then came symptoms of obstruction of the bowels, and vomiting of fecal matters, some of which were in lumps, which leads Dr. Rinteln to infer that they were formed in the small intestine. After ten days rather active medication, under which she grew worse, resort was had to opiates, and absolute rest to the bowels. At the end of three weeks her life was despaired of. On the twenty-fifth day, however, she greatly improved. On the preceding night there were five or six feculent stools, mixed at first with blood and mucus. In one of these about four inches of dark gangrenous small intestine were found. From this time her recovery was rapid, and it must have been complete, since she never afterwards had the least difficulty in passing motions. [Similar cases in younger subjects have several times been noted. By the courtesy of Mr. Hutchinson, the reporter saw one such in the practice of Dr. Stutter, of Sydenham, in which a boy passed nearly a foot of small intestine, and recovered. Rinteln's case is, however, interesting on account of the patient's age.]—*Lond. Med. Rec.*, July 15, 1875.]

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## SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

39. *Treatment of Wounds and Surgical Dressings.*—Prof. SPENCE remarks, in his recent Address in Surgery, that "the truly philosophical views of the adhesive process, taught by John Hunter, gradually led to clearer notions as to the requirements of wounds, and the principles on which their treatment should be conducted; and nowhere were these views more fully and intelligently carried out in practice than in this city [Edinburgh], mainly through the influence of the

writings of John Bell, and subsequently by the treatises of Liston and Syme on the treatment of incised wounds. The principles laid down were simple; thorough cleansing of the cut surfaces, waiting until all oozing had ceased and the surfaces glazed with lymph, before uniting them finally by sutures; cold applied for some hours to moderate excited action, then light dry dressing, and no interference with the wound except what was required to keep it clean. But, at the same time, great attention was paid to the general state of the patient. The results obtained were excellent, and, until recently, this has been the system in use here. But simplicity has sources of failure, for it is apt to lead to carelessness in dressing. We are again in a transition state in regard to the treatment of wounds. The antiseptic method (as it is termed) of my esteemed colleague, Professor Lister, is being pressed in some quarters to the exclusion of conditions which I think at least equally, if not more, important in the treatment of wounds and operations. This is not the place, nor is there time, to discuss the theory as to production of putrescence by germs from without, or whether that condition may not also arise from within owing to certain states of the blood and general system; nor yet as to the comparative value of the different antiseptics at present contending for pre-eminence. But some of the statements advanced in favour of the antiseptic system so ignore the success obtained by simple dressing and treatment of wounds, or assert such an amount of infallibility as to the curative powers of the special method, as to require notice. When I read statements to the effect, 'that the antiseptic method is to be regarded as one of the most important contributions to modern practice, inasmuch as it makes wounds heal by first intention, instead of going through the painful process of granulation and suppuration,' I can only regard such statements as arising from want of experience in, or misrepresentation of, the simple method of treating wounds; for, assuredly healing by granulation is neither the object nor yet the general result of that treatment. Suppuration, I believe, is not unknown under the antiseptic method, whilst the average duration of treatment is certainly not lessened. But when I find a German professor and hospital surgeon stating that, after a year and a half's experience of the antiseptic treatment, he is able to guarantee with certainty a perfectly successful result to his operations, such assertion challenges closer examination, demands proof, and forces me to ask the question, How far, apart from other conditions, do different modes of dressing stand in the relation of cause to successful results? The answer to this important question must rest on sufficient data and carefully weighed statistics. It will not suffice to point to some brilliant results in individual cases, because all methods of treatment can produce that kind of proof; nor will it do to state that no deaths from pyæmia have occurred under the system. At one time that term was never met with in the bills of mortality, and it is rapidly disappearing now. The statistics for proof must indicate the nature of the disease or injury for which the operation was performed, and the cause of death in fatal cases (for deaths still occur), not by a conventional term, but by giving the symptoms during life, and the organic lesions found after death.

"With extensive statistics of this kind, we would be better able to judge of the comparative advantages of different systems of treatment. At present all is assertion or reference to special cases, or to the not very definite statistics of foreign hospitals, and it is not a little curious that we hear most of the success from abroad. I think sufficient time and scope have been given to the antiseptic system in this country to enable those who use it to furnish statistics such as I have indicated, and thus to enable us to judge more dispassionately of its real merit. In comparing of late the results of my own hospital practice, I have been struck with the success which attended very simple treatment, and this leads me to question our progress in departing from such treatment for more complicated methods. Thus I find that, during a period of three years, out of sixty-three major amputations for disease, there were only three deaths; and of twenty-three cases of excision of joints, only two deaths, at a time when the treatment consisted in thoroughly cleansing the cut surface by pouring tepid water over it, and occasionally applying tincture of iodine alone, or diluted, on the flaps; whilst the dressing consisted merely

in laying a veil of lint or thin muslin over the stump. Again, when preparing statistics of my amputations for my published lectures, I found evidence that certain conditions, such as the nature of the disease or injury necessitating the operation, had most important influence on the result; such influence, indeed, as I could not have supposed until the statistics brought it distinctly before me, and my later statistics corroborate my former; so that I cannot accept the statement that any method of dressing, however good, will ever enable us to guarantee success. Whilst I speak of the antiseptic system, meaning the special method, I need hardly say that all surgeons have for their object the avoidance of putrescence, though their views may differ as to the best way of attaining their object.

"I cannot close without recommending to notice the advantages obtained in treating lacerated wounds and burns of the extremities by continuous immersion in the tepid bath. The avoidance of all meddling with the injured part, and of the agony of the patient caused by changing dressings, is thereby so completely attained, that the method requires only to be fairly tried to show its advantages. In the case of burns these advantages are most conspicuous, for the constant moisture keeps the cicatricial tissue pliable, and motion of the parts can be effected gradually, whilst the limb is immersed in the bath. The water may be rendered antiseptic by carbolic or boracic acid should that be considered desirable."—*British Med. Journ.*, Aug. 14, 1875.

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40. *Healing of Wounds by Blood-tissue.*—Mr. JOHN CHIENE, Assistant Surgeon, Edinburgh Royal Infirmary, states (*Lancet*, July 10th, 1875) that the organization of an accidental blood-clot in open antiseptic wounds in Mr. Lister's practice and in cases under his own care, first suggested to his mind the propriety of trying to heal a recent open wound by filling, at the time of the operation, the cavity with blood, which would coagulate, become organized, and which in time would become covered with epithelium. The expectation was that less contraction would follow if the wound healed by blood-tissue than if it was allowed to granulate and heal by cicatrization.

Mr. Chiene has tried this plan in one case in which there was promise of a favourable result, but the practical value of the method has yet to be tested by further experiment.

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41. *Chloral as a Surgical Dressing.*—Prof. MARC SÉE, of the St. Eugénie, advances some remarkable evidence in favour of the great value of chloral as a dressing, employed in the proportion of 1 per cent. in water. He first employed it in a case of diphtheritis of the vulva, and the success was so great that he has since used it in numbers of cases during nearly a year, without ever being disappointed. He has applied it in wounds of bad aspect, disinclined to cicatrize, in contused wounds accompanied by much detachment of soft parts, and actual or threatened mortification, or abundant suppuration. He has injected it into the centres of abscesses and sinuses connected with bone, and has also used it in dressing simple wounds, whether accidental or surgical. In all these cases the result was most satisfactory, without any accident whatever calling for the suspension of the chloral occurring. In patients whose wounds on their entrance were complicated with erysipelas or diffused phlegmon, two or three days' use of the chloral has sufficed to arrest the progress of such complications. After cleansing the wound and its vicinity by means of a little charpie (avoiding the use of sponges) dipped in the solution (and when the wound is deep and irregular, filling it with this, so that it may gain access to the most remote corners) he covers the whole surface with pledgets of charpie thoroughly imbibed with the chloral, and having covered these with oiled silk, envelops the whole in a thick layer of wadding, and applies a roller somewhat tightly. The chloral is pleasant to the smell, soils neither the fingers nor the bedding, is not too volatile, and causes no pain on application. It has been of great service in several cases of ozæna without necrosis, and it would be difficult to mention all the applications of which it is susceptible. Whenever fetidity has to be destroyed, fermentation, putrefaction, or the production of vibriones, etc., to be arrested, it fulfils the indication with certainty and inoffen-

siveness. Its moderate price, also, is a matter of importance in hospital administration, as a kilogramme is to be had for twelve or fifteen francs; and as a litre at 1 per cent. contains ten grammes, the price of which is from twelve to fifteen centimes, next to water itself it is the cheapest article that can be employed.

At a recent meeting of the Société de Thérapeutique (*Bullet. de Thérap.*, July 30), M. Créquy strongly recommended chloral as an injection in ozæna, in the proportion of two parts to 250 of water. He places a caoutchouc tube in the vessel containing the solution, and, raising this above the patient's head, allows the fluid to pass into the nose by siphon action. Several members of the Society testified to the utility of the solution as an application in scrofulous and fetid ulcers, in the eschars produced by decubitus, etc.—*Med. Times and Gaz.*, Aug. 21, 1875, from *Journ. de Thérap.*, July 25, 1875.

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42. *Ligature of a Main Artery to arrest Inflammation.*—Mr. C. F. Maunder, in one of his Lettsomian lectures on the surgery of the arteries, gives the following facts and conclusions regarding the ligature of a main artery to arrest inflammation.

"That ligature of the superficial femoral artery has arrested acute inflammation consequent on wound of the knee-joint.

"That ligature of a main artery will quickly diminish profuse suppuration, and prevent death by exhaustion.

"That, while it arrests profuse suppuration, it will, by allowing the patient to gain strength, afford an opportunity for amputation at a future time.

"That gangrene and secondary hemorrhage, as the result of ligature, should not be anticipated in the healthy subject.

"That the dread of these has arisen from our knowledge of the consequences of the ligature in instances of known diseased vessels—aneurism, for example.

"That a slough on the heel, caused by the pressure of a splint, was quickly detached, and the wound soon closed, although the superficial femoral had been tied a few days previously.

"That symptoms of inflamed bone, "starting pains," quickly disappeared.

"That the arterial tension of the rest of the body will be increased beneficially by the ligature.

"Such, Mr. President, are the conclusions at which I have arrived from a review of the above subject; but, seeing that this operation was originated in America long before I was born, while I thought it had been first suggested by me in 1866, I may well say 'there is nothing new under the sun.'"—*Lancet*, July 10, 1875.

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43. *Two Cases of Aneurism, one of the Carotid and one of the Femoral Artery, treated by Wire Compress, both successful.*—Mr. J. Dix, of Hull, communicated these cases to the Surgical Section of the British Medical Association. His operation is as follows: The artery is cut down on, and the wire is drawn under the artery by the aneurism-needle in the usual way. Each end of the wire is then attached to a needle, and so brought out through the tissues by the side of, but clear of the wound, so that the ends are about half an inch from each other. A piece of cork is placed between the points of exit of the wire, and pressed firmly down in the course of the artery; and over this the wire is tighly twisted till the circulation is stopped. In each of the cases related, a feeble current of blood was admitted into the sac for three days, and only on the fourth day was it entirely cut off. In twenty-four hours afterwards, consolidation of the aneurism had taken place. The wire is removable at any time, and in these cases was removed on the sixth and seventh days. This the author considered one of the greatest advantages of his method, as it allows the gradual establishment of the collateral circulation, and greatly diminishes the risk of gangrene, if not removing it altogether. It does not cut the inner coats of the artery, nor cause ulceration of its outer coat; its blood-channel is intact, and hemorrhage cannot possibly occur. Bleeding (the greatest danger from ligature) is entirely abolished; and gangrene, the next most fatal risk, is much diminished. The wire compress has other advantages over the

ligature. Thus it is not a foreign body in the wound, and therefore does not excite suppuration and impede breathing. It is applicable to all arteries alike.—Dr. PIRRIE (Aberdeen) said that a great deal had been brought forward on acupressure. Since 1854, he had used no other method of arresting hemorrhage in any operation, unless in those on the tongue, upper jaw, and deep tumours of neck. His belief in it was unshaken; and acupressure, defined as "metallic compression, removable at pleasure," he believed to be one of the greatest improvements in modern surgery. In regard to its use in aneurism, there was no time to discuss it, although he would have been most happy to do so.—*British Medical Journal*, Aug. 28, 1875.

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44 *Concluding Report of a Case of Innominate Aneurism, treated by Ligature of the Left Common Carotid and Subclavian.*—Our readers will remember the report of this case, which appeared in our number for April last, page 555. As the case may be considered one of some surgical interest, and an example of a mode of treatment as yet on its trial, we publish the ultimate result of the case as reported in the *Lancet* for July 31, 1875.

The operation was performed on September 8th, and up to date of last report the man was going on favourably. The subclavian wound had firmly healed, and there was but a little stain of discharge from a granulating spot in the line of the carotid incision. The patient had little or no pain, the impulse was less, the bruit was less marked, and there was very trifling impediment to his deglutition, and he was allowed to go about the ward.

On October 24th he very imprudently went out of his room with simply his night-dress on, remaining some half an hour out of his bed in the cold. The next morning he was taken with shivering, and had rheumatic-like pains generally. The pulse rose to 95, the impulse became very marked above the clavicle, and a little bleeding came on from the lowest part of the carotid wound. Ordered a mixture of carbonate of ammonia, chlorate of potash, and tincture of aconite, half a minim, every four hours.

*October* 25. Pulse 88.

26*th*. Pulse 80; impulse less. No pain.

27*th*. Pulse 80.

28*th*. Pulse 76. To take the mixture at eleven, four, and nine o'clock.

29*th*. Pulse 76. Mixture at eleven and nine o'clock.

30*th*. Pulse 75. Bowels too relaxed. To take two minims of tincture of aconite, twenty-five minims of chlorodyne, and one ounce of infusion of gentian, twice a day.

31*st*. Pulse 92. Cough very troublesome last night, and after a paroxysm free hemorrhage came on from carotid wound at 9 P. M. Applied lint soaked in tincture of iron, and strapping, and gave a dose of solution of morphia. This morning lies in a sleepy state. No more hemorrhage; tumour pulsating forcibly; marked œdema of left hand; some œdema of feet.

*November* 1. Pulse 95. Hemorrhage again last night after a bad fit of coughing.

2*d*. Pulse 96. No hemorrhage.

3*d*. Pulse 96. Coughs up a tenacious mucus.

4*th*. Pulse 88; impulse feeble.

5*th*. Pulse 86. Hemorrhage at 5 o'clock this morning.

7*th*. Pulse feeble. No particular pain in the chest. Has had a little œdema of right eyelid for the last two or three days, and to-day the cornea looks cloudy, and is apparently perishing.

9*th*. Cornea has given way; vitreous and lens escaped; eye collapsed. Face a little drawn to left; swallows without much difficulty.

10*th*. Hemorrhage again at 8.30 when in the act of smoking; arrested by the same means as before. Has no difficulty of breathing if he turns his head to the right, but it comes on if he turns it to the left.

11*th*. Pulse weak and intermitting; complains of no pain, but, putting his hands together, says "his breath is like that."

12*th*. Died comatose at 10 o'clock this morning.

*Necropsy, six hours after death.*—Body thin, but not emaciated. Base of

neck above the collar-bones bulging, a plug of coagulum presenting at lower part of carotid wound. In removing the sternum and sternal end of clavicle careful dissection was needed to avoid tearing the parts immediately beneath. The ascending aorta was generally dilated, and arising from it was a semi-solid tumour, formed by the arteria innominata, the size of a small orange. Pericardium filled with fluid. Upper part of right lung, symptoms of recent pleurisy. The right subclavian artery was obliterated, and adherent at ligatured part to the first rib. The aneurism had given way just below the ligature of the carotid; the pneumogastric nerve was flattened out on the aneurism. Adhesion of descending aorta to spine, tearing at one point, where a distinct little aneurism, size of a walnut, had corroded the bodies of the tenth and eleventh vertebræ. Lungs were adherent in parts from recent pleurisy, and filled with frothy mucus, but not consolidated. Dura mater adherent in several parts to hemispheres; pia mater opalescent, and evidences of chronic irritation as seen in hard drinkers; excess of fluid at base of brain. Brain-substance pale and soft. The "posterior communicans" artery on right side obliterated, or rather reduced to a fine fibrous thread. Liver very contracted, with marks of old inflammation on its capsule.

The man survived the operation sixty-five days. Mr. Ensor thinks that, had it not been for his imprudence in exposing himself to the cold night air and setting up the acute attack of pleurisy, he would have survived longer; the paroxysm of cough put more strain on the circulation than the weakened artery could bear. But that he would have lived much longer is very improbable, as there was a spot on the posterior aspect of the aneurism which was as thin as a kid glove, and which would have soon given way. Mr. Ensor thinks the man's life was prolonged by the operation—a questionable benefit. He has no doubt he was spared much suffering, both by the operation and by the use of aconite; for had it been left to nature, the tension and erosion of unyielding tissues would have caused constant severe pain, whereas from the time of the ligature of the arteries the pain was diminished in a marked degree; and the end was certainly a euthanasia in comparison with that which I have seen in other cases of aneurism.

In a younger subject, and with as distinct a diagnosis of innominate aneurism, Mr. Ensor should not refuse a similar operation; but the diagnosis as to whether the arterial change is limited to the innominate is difficult—that it should be so limited is improbable.

As far as his experience goes, Mr. Ensor believes that chronic alcoholism and syphilis are the two most important causes in bringing about that condition of artery which results in aneurism.

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45. *Malposition of the Aorta, due to Rickets, simulating Aneurism.*—The *Edinburgh Med. Journ.*, July, 1875, contains an interesting lecture by Dr. George W. Balfour on this subject with an account of three cases in which rickety distortion of the skeleton gave rise to abnormal conditions of the blood-vessels closely resembling aneurism. "It is well," he remarks, "to be aware of, and prepared for, the occurrence of such cases, and thus avoid falling into mistakes, which, in any case similar to that I have just referred to, might be fraught with very serious results to one or other, possibly to both, of the parties concerned.

"You will, therefore, remember that even a fluid pulsation in any of the intercostal spaces is not necessarily an aneurism. That the absence of any history of empyema, or even the distinct connection of the pulsation with the aorta by continuity of dulness, is no proof of its being aneurismal in character, either in the sense of a sacculated aneurism, or of its being a simple dilatation. Because, even in the normal condition of the skeleton, the aorta may exceptionally be so deflected as to cause its pulsations to become perceptible in one or other of the intercostal spaces; while this occurrence of abnormal intercostal pulsation of simple arterial origin is a matter of no unfrequent occurrence whenever the thoracic skeleton is deformed by rickets; while we must also never forget that, even in chests deformed by rickets, sacculated aortic aneurisms may occur.

"Where there is no twisting or bending of the artery, and no aortic regurgitation, the first case narrated would seem to show that—as we would naturally

expect—there is no murmur to be heard over the abnormal pulsation, and that the only sounds audible are those ordinarily heard at the base of the heart, the second, in particular, not being in any degree accentuated. Whenever, however, we have a murmur of regurgitation developed at the base of the heart, that of course is always more or less audible over the course of the ascending and transverse portions of the aorta; and apart from any constriction at the mouth of the aorta, we are sure to have a systolic murmur developed over any part of that artery wherever any sharp twist or bend occurs. Moreover, as any abnormal intercostal pulsation of the aorta must be nearer the surface than any normally situated part of that artery, all sounds in its course are liable to be heard louder over that pulsation than elsewhere, yet without accentuation. But whenever over any abnormal pulsation we have marked accentuation of any abnormal, but especially of the normal, particularly the second cardiac sound, we must be suspicious of the occurrence of a sacculated aneurism, and that even though rickety malformation of the chest be present. To make our diagnosis certain, however, we must be able, not only to connect the pulsation directly with the aorta, but to show also that the dulness subtended by that pulsating body occupies a space greater than would be the case were the pulsation due to a simple cylindrical vessel such as the aorta. Extension of dulness, therefore, beyond the pulsating tumour, associated with the signs and symptoms of pressure upon one or other, or upon several of the neighbouring organs, are among the most certain indications of the existence of a sacculated, or even of a cirsoid, aneurism. And from these signs and symptoms of pressure, associated with certain other phenomena which indicate the dependence of that pressure upon an elastic and distensile body of varying dimensions, we are often able to prognosticate the existence of an aneurism, even when no pulsating tumour has been detected; and, of course, we are in a still more favourable position for determining the existence of an aneurism when a pulsating tumour is perceptible."

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46. *Resection of Two-thirds of the Right Humerus; Complete Reproduction of Bone.*—Dr. RICORDI relates the following case: A boy, æt. 12, presenting some amount of rickety deformity, was admitted into the hospital at Milan with fracture of the arm, in consequence of a fall from a tree. The external part of the elbow had come into contact with the ground; and a portion of bone protruded from the fracture, which was reduced by the district surgeon.

On removing the dressings, Dr. Ricordi found a fracture of the humerus a little above the condyles, and a lacerated wound about two inches long at the outer side of the lower part of the arm, from which a little blood escaped. On making the upper end of the bone project, it was seen that there was a V-shaped fracture, and that there was a longitudinal fissure about 1.2 inch long in the bone, which was extensively denuded of periosteum. By drawing the forearm toward the chest and raising it, Dr. Ricordi exposed the bone more completely, and, on enlarging the wound upwards, he found that the periosteum was stripped off for a space of four inches. He decided on removing the denuded bone; and with a chain-saw divided it about two inches from the head of the humerus, and trimmed the lower end of the bone with bone-forceps. The portion removed from the upper part measured four inches; that from the lower about 0.4 inch. Three points of suture were applied to the wound; the arm was encased in a card-board splint with an opening opposite the wound, and the forearm was placed in a sling. There was but slight reaction, and the cure was complete on the fortieth day. During this period the bone was completely reproduced, without any shortening.

This case is remarkable on account of the extensive separation of the periosteum. The boy struck the ground with the outer side of the elbow, and the humerus was broken at the lower third: the force of the fall then being continued, the upper fragment of bone burst through the soft parts and protruded. The effect of the fall, however, was not arrested here; the periosteum, adhering more to the neighbouring parts than to the bone, was separated for some distance. And the case is interesting on account of the amount of bone removed, and of the rapidity with which recovery took place. This, however,

does not cause surprise when we consider that the periosteum only suffered a longitudinal fissure, preserving its vascularity, and retaining its adhesion to the neighbouring parts, thus presenting the most favourable conditions for rapid and regular formation of new bone.—*London Med. Record*, August 16, from *Bulletino delle Scienze Mediche di Bologna*, May, 1875.

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47. *Grafting of the Extensor Tendons of the Hands; Anastomosis of the Tendons.*—Dr. Gillette relates, in *L'Union Médicale*, February 13, 1875, the following very interesting case, which occurred under the care of M. Tillaux. A man received a wound on the back of his hand, by which the two extensor tendons of the fourth and fifth fingers were divided, and those fingers lost all extensor power and were permanently flexed. The blood having been excluded by Esmarch's bandage, two flaps were turned back, so as to expose the peripheral ends of the divided tendons, and these were then implanted or grafted into the uninjured tendon of the middle finger. This was done by making a sort of button-hole in the tendon (or in its sheath?) into which the two divided tendons were implanted by means of several points of metal suture. The operation was performed without anæsthetics, and the tendons (which were completely free from any trace of inflammation) presented evidences of lively sensibility.

The wound cicatrized kindly, and the man recovered the motion of both fingers.

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48. *Amputations in Scrofulous Subjects.*—A case related at a recent meeting of the Société de Chirurgie (*Gazette des Hôpitaux*, June 19), in which a scrofulous child exhibited remarkable resistance to several successive operations, led M. Verneuil to protest against the illusions that exist as to the innocuity of operations in scrofulous subjects, and especially operations performed on bones. As long back as 1845 he had been struck by examining in the hospitals the results of the partial extirpations of the bones of the hands and feet in scrofulous subjects. The immediate results are very favourable, erysipelas being very mild in these subjects, and pyæmia rare; and few are lost by acute traumatic accidents. The wounds are very fine, granulating abundantly—indeed, too abundantly; but the cicatrization is defective. When the patient attempts to use his limb, the disease reappears, either at the same spot, in other joints, or in some of the viscera. The amputation wound heals up, but the patient dies with albuminuria, general œdema, fatty degeneration of the liver, or tubercle. An English author, who is a good observer, recommends that operations should be performed early in scrofulous subjects, before the development of morbid manifestations in the liver or kidney, and that in them amputations, not excisions, should be resorted to. M. Marjolin partakes of M. Verneuil's scruples relative to the performance of operations in scrofulous children. Having been in charge of a children's hospital service for eighteen years, he has been able to follow the patients during long periods, as they re-entered the wards on several occasions. Inclined, as he was at first, to operate early, experience has taught him that these operations are premature before the constitutions of these little subjects have undergone modification, until when they should always be rejected, unless great urgency exists, which is rare. He has often seen infants, who had been operated upon and cured, re-enter and die of meningitis, pulmonary tubercle, or intestinal lesions.—*Med. Times and Gaz.*, July 10, 1875.

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49. *Supra-Condyloid Amputation of the Thigh.*—Dr. Wm. Stokes, in an instructive paper (*Dublin Journal of Medical Science*, August, 1875), advocates the supra-condyloid amputation of the thigh as possessing advantages over the knee amputations of Velpeau, Syme, Gritti, and Carden, and also over the operation of excision of the knee-joint, being attended with far less risk to the patient than that procedure.

He relates two cases in which he performed the operation with satisfactory results.

The advantages which he claims for supra-condyloid "amputation are those

which it has," he states, "in common with other amputations at the knee and those which are peculiar to itself. Among the former I may mention:—

"1. The stump being more useful for progression in consequence of the possibility of making pressure on its extremity, and the patient not being obliged to walk as if he had an ankylosed hip-joint, as is always the case when the point of support is at the pelvis. As Dr. Markoe says: 'To the poor man this single circumstance makes all the difference, between his being able to earn his living by active employment and his being laid up for life a hopeless cripple. To the rich man who is able to secure the aid of an artificial limb, it makes the difference between a point of support at the knee and a point of support at the ischium. In fact, it is practically the difference between amputation below and amputation above the knee.'

"2. The diminished liability to the formation of tubular sequestra.

"3. The operation is less hazardous, being further removed from the trunk than the ordinary amputations of the thigh.

"4. The shock is less than in the higher amputations, as the muscles which are divided are few in number, and being cut, not through their fleshy bellies, but at their tendinous extremities.

"5. Less liability to suppuration.

"6. Less liability to osteo-myelitis, from the medullary membrane not being interfered with.

"The special advantages of supra-condyloid amputation are—

"1. That the posterior surface of the anterior flap is bound with a natural synovial lining, which I feel confident largely diminishes the chances not only of subsequent exhaustive suppuration, but also of purulent absorption.

"2. Any possibility of the split patella shifting from its place on the cut surface of the femur is prevented by the high femoral section, and by stitching the two bones together in the manner I have described.

"3. The existence of an osseous curtain, which is formed by the split patella covering the cut surface of the femur, diminishes probably the chances of pyæmia, and is not liable to slough away as the periosteal curtain, as recommended by Von Langenbeck, undoubtedly is.

"4. The vessels are divided at right angles to their continuity, and not obliquely, as they are in other flap operations.

"5. The existence of a posterior flap diminishes the chances of any wide gaping of the wound posteriorly, while the anterior flap, being oval, increases the chances of the stump tapering gradually towards its extremity and assuming the form of a rounded cone.

"6. The preservation of the normal attachments of the extensors of the leg.

"To Professor Velpeau is due the credit of first recommending the preservation of the patella in amputations at the knee-joint, and this recommendation was adopted subsequently by Lane, Blenkins, and Markoe. To Gritti is due the credit of drawing attention to the fact of the great advantage that is derived from having the patella fixed, in order that there should be a firm standpoint on which the extensors may act. The operation, however, as practised by him, was in many respects a defective procedure, was attended, as Prof. Rizzoli informs us, with a high rate of mortality, and consequently soon fell into disrepute.

"In supra-condyloid amputation, which is the outcome of the procedures I have alluded to—notably those of Velpeau, Syme, Carden, Gritti, and Rizzoli—I have retained the advantages observable in these operations, and eliminated what experience has shown to be defective in them, and the results obtained in my hands, and in those of my colleague, Professor Macnamara, and the other eminent surgeons who have performed the operation, lead me to the conviction that it must be conceded that, in supra-condyloid amputation, a signal advance has been made in operative surgery."

In addition to other advantages Dr. S. asserts that it is the operation of its kind which is attended with the minimum of risk to the patient's life.

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50. *Treatment of Fractures of the Lower Extremity by Weight and Pulley.*—Prof. SPENCE, of Edinburgh, in his admirable address on Surgery, at the

recent meeting of the British Medical Association, remarked: "Looking at some of the more prominent recent changes in surgical practice, a superficial observer might almost imagine that instead of progressing, our science moved in a cycle; and were he inclined to be cynical, he might suggest that we had revolved back to the period of sheer mechanical forces, complicated dressings, and red-hot knives. A nearer and more appreciative examination will show us, however, that even in cases where the principle is not new, the method of applying it has been so modified and improved as to constitute a real advance and addition to our resources. Let me take as an example of this, a method of treating fractures of the lower extremity now much used—*extension by weight and pulley*. . . . .

"Mr. John Bell, in his great work on *Surgery*, speaking of the machines used in treating fractures, says: 'I may, perhaps, do you some service by explaining the simple principles of this department of surgery; and then you will be able to enter the magazines of Scultetus, Hildanus, and Pareus, filled with engines not unworthy the chambers of the Inquisition, without being tempted to bring out along with you any of their lumber.' Accordingly, he does enter the magazines of apparatus, and criticizes them with his usual scathing sarcasm. Amongst other 'lumber,' he unhangs from the walls of the magazine of Hildanus a weight with circle and strap for hanging from the ankle, and drags to light a bed with a surcingle or perineal band of horse-girth for fixing the body to the upper part of the bed; and on this rude apparatus for permanent extension he makes ironically laudatory remarks. Mr. Bell would have been better employed if, when he exhibited the rude apparatus of Hildanus, and admitted its power of maintaining permanent extension, he had thoughtfully considered how its defects might be removed, and it might be converted into a simple and effective means of treating fractures of the lower extremity. Let me again take the dust off this bed and weight of Hildanus, and place them alongside some modern surgical upholstery, and see how like they are. Here is the weight and pulley method copied from a recent work on surgery. How very like! The perineal band or surcingle fixing the patient; the weight hanging from the foot through the pulley fixed at the foot of the bed. But how is the weight hung from the limb? No longer by a circular strap around the ankle, acting on one part only, and so unendurable, but to long plasters fixed to and embracing a great breadth of the limb from immediately below the fracture, and so diffusing pressure that the patient feels no inconvenience, and is scarcely sensible of the extending force. That makes the difference. But something is still wanting to its perfection. Can we get rid of that perineal band, which proves so troublesome to patient, and surgeon, and nurse? How can we dispense with it, and maintain a counteracting force to the extension from the foot? Tilt up the lower end of the bed; place blocks of wood below the feet of the bed; take off the perineal band, and let the body be the counter-extending force; and there you have the simplest, least irksome, and most perfect method I know of treating fractures of the thigh, and, if possible, still more useful in treating oblique fractures of the tibia. . . . .

"Now, after some years' experience in the use of the extension-pulleys in fractures of the thigh in very young children and in adults, in fracture of the neck of the femur in old persons, and in long oblique fractures of the tibia, I unhesitatingly commend the method to all who may not have tried it. Of course, in fractures of the shaft of the femur, lateral splints are required, just as when we use the long splint, and also for lateral support in fractures of the leg. When there is much bruising, however, I merely use sand-bags to prevent lateral displacement; and I also prefer deep sand-bags, to prevent rolling of the limb outwards in fractures of the thigh, to a long lateral splint, as used in America. In fact, the full advantages of the extension-pulley method are only secured when we abandon the perineal *lacque* and long lateral splint, and make the body the counter-extending force.

"Looking at the extension method, as thus improved and simplified, I think we may fairly reckon it as progress in a most important department of surgery; but, whilst we congratulate ourselves on our advance, and replace the bed and weight of Hildanus in the *armamentarium antiquorum*, let us regard

it not as 'lumber,' but reverently with the homage due to the perception of a true principle, however rude in design and execution the apparatus may be."—*British Med. Journ.*, Aug. 14, 1875.

51. *Manual Method of Reducing Dislocations of the Hip.*—Prof. SPENCE, in his Address in Surgery before the British Medical Association, makes the following interesting remarks on this subject:—

"The manual method of reducing dislocations of the hip has been revived and used with great success; so much so, that the reduction of these luxations, which formerly entailed much trouble and the expenditure of great force, can now be effected in recent cases as if by magic. I have said that the use of the rotatory or circumduction method has been revived; perhaps I should rather have said revived as a general practice, for, in truth, it has never really been altogether abandoned. We generally hear it spoken of as the American method, and undoubtedly it is to the writings of Drs. Reid and Bigelow, of the United States, that we owe the more general use of the practice in this country; but it is not a little curious that it has been so little known or used, seeing that it is mentioned and described in some of the principal French works on surgery—not old black letter, but modern books, in the possession of most of us. Thus in Nélaton's *Pathologie Chirurgicale*, published in 1847–48, there is the following statement in reference to the dislocations of the hip: 'In 1835, M. Deprès made known a method which cannot be too highly recommended on account of its simplicity and the real services which it has rendered in certain difficult cases. . . . This method consists in flexing the leg on the thigh, the thigh on the pelvis, to exaggerate even the movement of flexion and abduction of the limb, then to exercise with it a gentle movement of rotation outwards, whilst at the same time it is abducted.' This method, says Nélaton, is described by Pouteau in his *Mélanges de Chirurgie*. M. Chassaignac, in the second volume of his *Opérations Chirurgicales*, 1862, speaks of this method of reducing dislocations of the hip, and quotes the text of Pouteau as follows: 'Surgeon-Major Maison-Neuve, of the Regiment of Maugiron, a man of great merit, and trustworthy, assures me that he has reduced such luxations without the assistance of any extension. He first flexes the thigh at a right angle with the body; he then executes with the thigh a movement of rotation, which makes it approach the belly as nearly as possible, then carries it out towards the haunch, and returns it immediately by drawing it down towards the sound thigh.' Pouteau adds that this method was known to the ancients, and that it is mentioned by Hippocrates and Paulus Ægineta. The diagram to which I point is an enlarged copy of an illustration from a French work on Bandaging and Surgical Appliances, by Dr. Goffrés, published at Paris in 1859, and shows the surgeon in the act of using the manual method of Deprès. For this I am indebted to my friend Dr. Paterson, formerly of Bahia. M. Chassaignac enters very fully on the principle of the method; and there is a curious sort of coincidence in terms between his use of the letter Y, to assist his description, and the use made of the same letter by Dr. Bigelow, to mean a totally different thing. Dr. Bigelow speaks of the Y ligament as playing an important part in the rotary method, describing the ilio-femoral ligament under that name, on account of the divergence of its fibres at their attachment to the femur. Chassaignac describes the leg and thigh, when bent, as representing a pair of compasses opened at a right angle, the lower or horizontal branch represented by the leg, the upper or perpendicular branch by the thigh—this latter divided at its upper extremity into two parts, like the letter Y, one part being fixed, represented by the ilio-femoral ligament, the other movable, represented by the head and neck of the femur; and then he proceeds to demonstrate how, by using the leg as the arm of a bent lever, whilst the ligament, being fixed, forms a pivot, the movable part—the head of the femur—is forced or directed to the acetabulum. Here we have an example of advance by the attention of the profession being directed to a method which had been practised from an early period, and which has never been altogether obsolete."—*British Med. Journ.*, Aug. 14, 1875.

52. *Reduction of Dislocation of the Shoulder.*—M. Revillout gives an account of the mode which M. Panas adopts for the easy accomplishment of this. M. Panas believes that almost all these dislocations are produced by a rotation of the humerus; and as the result of numerous experiments he found that it is very easy to lacerate by a movement of rotation a capsular ligament which would resist a direct traction of 600 kilogrammes. Generally, also, the tendon of the subscapularis is ruptured in the dislocation forwards. For the easy reduction of this dislocation it is of importance to keep the arm rotated outwards. For, in fact, once beyond the button-hole laceration of the capsule, the head of the bone, when carried inwards, lies supported on the inner lip of the laceration; so that if reduction be attempted in this position, the head being separated from the glenoid cavity by a more or less broad ligamentous bridle, it cannot succeed unless by rupturing this bridle, which it is not always easy to do. When, however, muscular resistance having been overcome by a sufficient extension sufficiently prolonged, the head of the bone is brought by rotation outwards to the middle of the rupture, it suffices to push it with the hand to effect reduction—if it has not become self-adjusted without any noise. Preparatory to this movement of rotation, M. Panas causes traction to be made at the arm above the elbow, instead of at the wrist. In this way the flexed forearm is in readiness to be carried outwards at the appropriate moment. Much force is not required for extension, provided the muscular relaxation is patiently waited for. M. Panas has succeeded in this manner in somewhat old dislocations, providing a sufficient time had not elapsed to give rise to an altered formation of the articular cavity.—*Med. Times and Gaz.*, Aug. 21, 1875, from *Gazette des Hôpitaux*, July 31, 1875.

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53. *Value of Fluctuation as a Sign.*—Mr. T. H. Bartlett, in a short paper (*Brit. and For. Med. Chirurg. Rev.*, July, 1875), considers this subject. All surgeons are aware how often they are deceived with regard to apparent fluctuation being pathognomonic of the presence of fluid. He says, "there must be some peculiar or ill-understood or ill-recognized condition which led many skilful and careful men into error, and which are constantly leading our students into similar mistakes.

"I believe this false fluctuation to be generally due to the combination of two causes of error, one being muscular or glandular elasticity, and the other being muscular or glandular displacement.

"I think any one who tries the experiment will be surprised at the sensation of fluctuation which can be obtained by pressing alternately, as in endeavouring to find the sense of elasticity or fluctuation of an abscess, a muscle across the direction of its fibres, say the biceps, or by similarly manipulating across the direction of the ducts, a firm and fairly large female mamma; either one of these two before-mentioned causes alone might mislead: I mean either the displacement of the gland or muscle or the elasticity of the gland or muscle: but when you get combined the elasticity and the displacement, a supposititious fluctuation is felt so like to the real as to be almost if not quite undistinguishable from it. How, then, are we to be certain, especially in these positions, where either a gland or muscle is liable to mislead us, that the fluctuation we feel is really due to fluid? By a very simple plan, which I have never known to fail, and which is not clearly enunciated to my knowledge in any of our text-books, viz. by practising the manœuvre of palpation, not only across the line of the muscular fibres or of the gland ducts, but also in a direction at right angles to this.

"If the fluctuation be fluid it will be equally felt in all directions; if it be due to muscular or glandular elasticity or displacement, or both combined, it will be only felt in one direction, viz. across the muscular fibres or the gland ducts."

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54. *Electrolysis in certain forms of Vascular Erectile Tumours.*—Prof. Spence regards this as a most valuable addition to our means of treatment of these often formidable growths. "I do not speak of it," he remarks in his Address in Surgery before the British Medical Association, "as a general method, for there are many forms of nævi and erectile tumours, in truth a

majority of that class of diseases, in which other methods are more rapidly effective.

"Galvano-puncture is specially indicated in those cases in which the erectile tumour is deep-seated and covered by healthy undiscoloured skin. Until a few years ago, our interference in such cases was limited to dissecting off and reflecting the superimposed textures, so as to expose the tumour without touching it with the knife, and then strangulating it by strong ligatures, and, when the growth has sloughed and separated, replacing the flaps of skin; or by ligature of large arterial trunks indirectly connected with the growth—as, for example, ligature of the carotid artery for orbital erectile growths. The former method was attended with grave inconveniences and dangers, and the latter, besides entailing risk, was most uncertain in its effects, as you can readily understand from the nature of the disease. More recently, injections with the perchloride of iron took the place of these methods, and, in a great number of cases, answered very well, but in others a very considerable amount of sloughing took place before the rest of the tumour had been consolidated, and in such cases severe hemorrhage occurred, and the life of the patient was endangered. In some cases also the injections of perchloride were attended with a rapidly fatal issue, apparently from thrombosis. I must, however, say that I never saw such a result, though I have long used and continue to use the perchloride of iron injections, and I can only attribute such accidents to the neglect of tearing up the texture of the tumour before injecting the perchloride.

"*Contrast* of the results of different methods is perhaps the most effectual way of impressing their comparative advantages, and shows what advance our science is making; let me, therefore, bring under your notice the following cases from my own practice. An infant, six weeks old, was sent to my care on account of a deep-seated pulsating erectile tumour, occupying the palm of the hand, and extending up the wrist. The tumour had been growing rapidly, and at one point the skin was thin and discoloured. I used injection of perchloride of iron, and part consolidated. Again it was used, and the consolidation was followed by inflammation and the separation of a small central slough. From the ulcerated surface bleeding took place, and, though arrested by local application of the perchloride, it returned from time to time; and as the child's life was thus endangered, and the growth seemed rather to increase than diminish, I was forced to amputate in the forearm, when the infant was eight weeks old. She made a very rapid recovery, but with the loss of a hand. I show you here the cast of the hand of an infant affected with deep-seated pulsating erectile tumour very similar to the former. In this case I applied electrolysis during three months, while the child was under my care in hospital, and by several applications of the battery the growth began to consolidate and contract, whilst, except at the time of an application, the child suffered no irritation. As it was inconvenient for the mother to remain in hospital, I asked Dr. Connell, of Peebles, who had sent the case to me, to conduct the remainder of the treatment. As the child's parents lived at some distance from Peebles, the application of electrolysis could only be made at long and irregular intervals. Here is a cast of the hand when the cure was completed; and, when you contrast it with this preparation of the amputated hand of my former case, you will, I think, agree with me that the result is a triumphant vindication of the value of electrolysis in such cases. I have used it also in other cases with advantage, especially in an enormous erectile nævus of the face of a girl. It is of importance that it should not be applied indiscriminately to all cases of nævus or erectile tumours. I think its use should be restricted to cases where the erectile growth is covered to some depth by healthy skin. The needles are coated to a certain length with a non-conducting material, which protects the healthy superimposed texture, whilst the uncovered points passed into the growth act on it at different parts. If needles be applied to a superficial erectile spot, they cauterize and leave more mark than other methods, such as application of nitric acid, perchloride of iron, or iodine. Thus, in treating the large erectile nævus of the face, the electrolysis was only used to the deep-

seated portions, while the superficial discoloured marks were treated by applications of perchloride, iodine, etc."—*British Med. Journ.*, Aug. 14, 1875.

55. *Operations on the Air-passages.*—Prof. Spence, in his recent address on the Progress of Surgery, calls attention to some practical points connected with these operations. "There are," he says, "some conditions not sufficiently insisted on in surgical works as to their dangers, or the practice to be adopted, where action requires to be prompt. Thus the danger from emphysema of the loose connective tissue of the neck is seldom adverted to; and yet I have seen a patient all but suffocated from this cause from a small oblique wound of the larynx inflicted with a penknife. In that case, I had to perform laryngotomy, and was obliged to make numerous incisions to afford relief; when a simple enlargement of the wound, in the first instance, would have allowed the air to escape externally. Again, in tracheotomy for removal of foreign bodies, it is generally considered unnecessary to use a tube after the foreign body has been expelled, but merely to allow the incision to close at once. The consequence is that a good deal of trouble often results, for the wounds in the trachea and the superimposed parts do not correspond, and air and mucus escape into the cellular tissue, sometimes giving rise to considerable emphysematous swelling of the neck, and often leading to deep-seated irritation of the wound. In my own operations after removal of foreign bodies, I insert a tracheotomy tube, and retain it until the surface of the wound is glazed by the effusion of lymph; and then approximate the margins of the wound by strips of plaster, so as to avoid all risk of confinement of air or mucus in the tissues in the vicinity of the trachea. Another point of importance is the question of exhibiting anæsthetics in operations for removal of foreign bodies. Many years ago, I drew attention to this, and pointed out that when the foreign body was loose in the trachea or bronchus, the exhibition of anæsthetics interfered with the force of the expulsive powers which usually eject the foreign substance; and, as happened in one of my own cases, the foreign body may be carried back by the incoming current of air, occlude the bronchus, and cause collapse of the corresponding lung. In other cases, as when the body is impacted in the bronchus or larynx, anæsthetics are most useful in enabling us to search for and remove the foreign substance. In doubtful cases, the rule should be to open the trachea without using anæsthetics; and, if the foreign body be not expelled by the natural forces, then to administer chloroform to enable us to deal with it effectually. When, as in the case I have alluded to, a foreign body, such as a plum-stone, is impacted, and fairly occludes the bronchus, being carried before the inspired air, it follows that, the lung beyond being collapsed, there is no force behind to eject the substance. In such circumstances, it is well to avoid trying too much to displace it by means of bent probes or other instruments, unless the end of the instrument can be passed over and beyond the body, so as to tilt it out or allow air to pass to the lung beyond. Our continued efforts, besides exciting local irritability, are very likely to impact it more thoroughly; and I would therefore counsel the surgeon to abstain from useless efforts, and allow the patient to breathe by the sound lung, and wait the loosening of the foreign body by vital dilatation caused by its presence, when air will gradually pass beyond and expel it.

"In hollow or tubular foreign bodies, the case is different; they can be easily removed if we take the proper method—one which I practised some thirteen years ago, in a case where this trachea-tube had slipped down and became impacted in the left bronchus. Instead of trying to open the forceps and seize the edges of the tube, I passed the forceps closed into the tube, and then, on expanding the blades and maintaining them expanded, the foreign body was withdrawn with the utmost facility."—*British. Med. Journ.*, Aug. 14, 1875.

56. *Total Excision of the Larynx.*—On July 21 last, Prof. Von Langenbeck, of Berlin, performed the above operation on a man aged fifty-seven, with cancerous infiltration of the whole upper portion of the larynx above the ventricles, involving also the epiglottis and the hyoid bone, as well as the base of the

tongue. The first symptoms of hoarseness and dyspnœa began four years ago. In November, 1874, he came into the Surgical Clinic with severe dyspnœa, cyanosis, and symptoms of impending suffocation, and the diagnosis of carcinoma was made. As the patient refused to have the larynx removed at that time, tracheotomy only was performed, and he went out relieved in January. In July, 1875, he returned, still wearing the canula, but unable to swallow anything except liquid food. The larynx was swollen, broadened, and hard externally, and at the back of the tongue an uneven lobulated growth could be both seen and felt. His strength and general condition were favourable. The tracheal opening in the neck was, before the operation, continued downwards, and the trachea above the opening plugged with an air-bag, so as to prevent any downflow of blood into the bronchi. The patient was then narcotized by chloroform administered through a canula, and was kept completely unconscious for two hours. Langenbeck made a horizontal incision two centimetres above the hyoid bone, and extending from one sterno-mastoid muscle to the other, and bisected it by a vertical incision. The skin was then thrown back in two flaps, and the larynx dissected out, beginning from above and working downwards, so that the trachea just below the cricoid cartilage was the last part separated. The whole larynx, with the epiglottis, the hyoid bone, and the posterior third of the tongue, as well as the anterior and laterial portions of the pharynx, with the pharyngo-palatine arches, and a small piece of the œsophagus, were then removed.

The following muscles were divided, without reckoning the small laryngeal muscles: The sterno-hyoid and -thyroid, the omo-hyoid and mylo-hyoid, the digastric, genio-hyoid, stylo-hyoid and stylo-glossi, the stylo-pharyngei, and the glosso- and pharyngo-palatine. Forty-one arteries were ligatured, including both external carotids, which were each doubly ligatured and divided between the ligatures; and both phyo-glossal and lingual nerves were cut through. Both submaxillary glands were also removed. Langenbeck lays great stress on the operation being conducted from above downwards, as it enables the surgeon to lay bare the greater number of vessels, and to ligature them before they are cut, and so spare as much bleeding as possible. The preparatory plugging of the trachea is also all-important.

The excised portion of the larynx and tongue measured eleven centimetres in length, and the piece of tongue three centimetres, the incision being carried in front of the circumvallate papillæ.

After the operation, the immense wound was simply closed by compresses soaked in a one-third per cent. solution of salicylic acid, and no attempt was made to bring the skin together with sutures. The patient's condition on July 22, the day after the operation, was remarkably good (pulse 100), and he was able to take abundance of liquid nourishment through a tube passed into the œsophagus. On July 28 his progress was still good, and he had no fever. A two per cent. solution of boro-salicylic acid was being used to swab the pharynx and diminish the abundant purulent secretion from the surface of the wound.

This is the fourth case of excision of the larynx. Billroth, of Vienna, in 1873, was the first to perform the operation; he was followed by Heine, of Prague; and in 1874, Dr. Moriz Schmidt, of Frankfort-on-the-Maine, removed the greater portion of the larynx of a man of thirty-six for carcinoma. The patient died five days afterwards. In case his patient goes on well, Professor Langenbeck intends to wait until the wound has completely cicatrized before he attempts to adapt an artificial larynx.—*Medical Times and Gazette*, Aug. 28, 1875.

57. *Inquiry into the Condition of Fifty-one Cases of Lithotrity in Elderly Adults, made at Periods of one or two years after Operation.*—Sir HENRY THOMPSON has published (*Lancet*, July 3, 1875) his interesting inquiry on this subject, with a view of ascertaining whether the results were permanent.

During a period of seventeen months, Sir Henry performed lithotrity on 53 patients, of whom two died, leaving 51 recoveries. "The mean interval between the date of operation and the present report of condition, for these

51 cases which are the subject of inquiry, is, therefore, about twenty months instead of 'one year.' An examination of these cases, given in a tabular form below, shows that respecting six patients I have been unable to obtain the information required; but the weight of such evidence as exists relative to these is greatly in favour of their being better and not worse than the average, since their mean age is only fifty-four years, nearly ten less than the mean of the whole series. As I am compelled to omit these from my reckoning, I believe that my report is less favourable to lithotrity than it ought to be.

"The number of individuals, then, of whom I have precise information, is 45, averaging about sixty-four years of age. Of these, 11 have since died. The causes, certified by their medical attendants, were—2 of organic heart disease; 1 of malignant disease; 1, at eighty, of natural decay; the other 6 of urinary disorders and advanced age together (the mean age being sixty-six years). All but one of these latter were individuals who for several years had passed no urine except by catheter, who owed their lives solely to surgical art, and who without it must have died miserably some years before. The prolongation of life had been entirely due to the improved modern means of mechanically removing retained urine and accumulated phosphatic deposits. Of the 45, 34 are living still; 28 of them enjoying good health and active existence, at a mean of sixty-three and a half years of age. The other 6 have some signs of recurring calculus, 2 having had a newly formed calculus removed; all are well but one of these, who is in bad health and suffers much.

"I think I may leave these figures to speak for themselves. I shall make one observation, however, which, although a very natural one, does appear not to receive the consideration which I think it deserves. Supposing that these 53 cases of lithotrity (including 2 deaths with 51 recoveries) had been cut instead of crushed, how many fatal cases would have followed the operation? Their average age being sixty-three, 14 deaths would not have been a bad result, somewhat better than published tables offer us.[1] But after these operations, mainly done in 1873, only 11 deaths have since occurred *up to the present date*. And even if we were to reckon all these as deaths resulting from the operation, although, as may be seen below, they were quite unconnected with it, we still should have a total of recoveries larger than after lithotomy. There is, however, much reason to believe that the few examples of chronic cystitis with recurring phosphatic deposits, subsequent to lithotrity, occur generally in those feeble and diseased persons to whom lithotomy is most commonly fatal. The fact is, that almost all those patients whose subsequent troubles remain, and who, to superficial observers, appear to discredit lithotrity, do in reality owe their existence to the operation, and are trophies of life absolutely saved by it.

"Thus it is that lithotrity, as I have observed, has created a new set of cases —men who, until the process was brought pretty nearly to its present perfection, never lived. Respecting them I should like to write the results of my experience, and hope ere long to do so. They are men whom lithotrity keeps alive—who, thanks to the ease and safety with which a small and newly formed phosphatic calculus can be crushed, go on for years to live and even to be active. These cases have to be kept apart from other cases of stone, because it would invalidate any inference from numerical statements were a surgeon to reckon as a 'case of lithotrity' each time, perhaps twice a year or more, he removed a calculus from such a patient, although it might not always necessarily be very small. But it is not to be forgotten that before the time of lithotrity there was no adequate help for such a patient except by the cutting operation, and many such died miserably with bladders filled with phosphatic material."

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58. *Treatment of certain Cases of Stricture of the Urethra by a Combination of Internal and External Division.*—Mr. Thomas Annandale remarks (*Ed. Med. Journ.*, June, 1875) that the recognized treatment of stricture of the urethra, complicated with numerous fistulous openings and great thickening of the perineal and scrotal tissues, is a free external division of the perineum

[1] I may refer to my own table of 1827 cases, collected with great care, among others, as supporting this view. "Lithotomy and Lithotrity," 2d edit., p. 142.

and strictured part of the urethra. The difficulty of thoroughly dividing the entire strictured portion of the canal Mr. A. has experienced, especially when the stricture is a light one. Another difficulty in such cases is the fact that a considerable extent of the urethra is often involved, or several strictures may exist, and experience shows that unless the whole urethra be properly dilated, a good result cannot be expected.

A few weeks ago a patient was admitted into Dr. A.'s wards, suffering from an aggravated form of this condition. "He had suffered from stricture of the urethra for four years, and about eighteen months before his admission abscesses formed in his perineum, buttocks, and scrotum, and gave rise to numerous fistulous openings in these situations. An examination determined the existence of a tight stricture of the urethra in the region of the bulb and anterior to it. The stricture was nearly two inches in length, and in addition there was a stricture, not so tight, in the anterior part of the urethra, about two inches from the meatus. There were five or six fistulous openings in the perineum, and several others in the buttocks, close to the anal orifice. The whole perineal textures were much thickened, and several hardened nodules of skin and cellular tissue were scattered through this region, resembling somewhat in appearance those occasionally met with in cancerous disease. The whole of the urine was passed through the fistulous openings. With some difficulty a No. 2 metal catheter could be passed through the stricture into the bladder.

"In considering the treatment of this case, I knew it would be necessary to freely incise the middle line of the perineum, and also to divide the strictured portion of the urethra, in order to obtain a cure of the affected parts; but I also knew from experience something of the difficulties in successfully carrying out this proceeding. I was therefore glad to avail myself of a hint which I received in reading some very interesting papers on stricture of the urethra, by Professor Otis, of New York; for his suggestion seemed to me to be one likely to be very valuable in certain cases of the kind under observation. Professor Otis, having a case of stricture complicated with fistulous openings to treat, first incised the perineum, and opened the urethra externally to a slight extent, and then introduced a urethrotome, and freely divided all strictured portions of the canal.

"Taking a lesson from this case of Professor Otis, I operated on my case in the following way:—

"Having passed a No. 2 silver catheter through the strictures into the bladder, I made a free incision in the middle line of the perineum, through the thickened tissues, and opened into the urethra immediately behind the point of the posterior stricture. I made no attempt to divide the stricture by this external incision, but, having removed the catheter, I introduced along the urethra into the bladder the fine-grooved staff of a urethrotome (one after Maisonneuve's principle), and then, by passing the knife of this instrument along the whole length of its groove, the entire strictured portions of the canal were thoroughly divided. The whole operation did not occupy more than a few minutes, and I was much impressed with the advantages as regards easy and quick performance over the method of external division as usually followed. A No. 12 catheter was readily passed into the bladder after the operation, and was retained there for twenty-four hours. The patient's progress after the operation was in every way satisfactory. The thickening of the tissues gradually but entirely disappeared, and the fistulous openings soundly closed. The urine now comes freely by the natural way, and a No. 12 bougie can be easily passed along the whole course of the urethra into the bladder. The operation wound in the perineum has nearly closed, and not more than a drop of urine passes occasionally through it.

"A second case of urinary fistula was shortly after admitted into my wards, and was treated in the same way, with a like good result."

This plan of operating appears to Mr. A. to be well worthy the notice of surgeons. "I do not," he says, "advocate it in cases of stricture other than those of which the cases related are illustrative examples; but I have no hesitation in strongly recommending it in suitable cases. Internal division is be-

coming more and more recognized in this country as the safest and most efficient treatment of strictures of the urethra which do not yield to simple dilatation, and my extended experience of this operation during the last few years has made me a firm advocate of it in proper cases.

"The combination of internal division with external division in complicated strictures such as have just been illustrated by these cases, has, in my opinion, the following advantages over external division alone:—

"(1.) The complete and accurate division of all strictured portions of the urethra.

"(2.) Its easy accomplishment.

"In cases of complicated urinary fistula, in which the stricture of the urethra is impassable to instruments, or a portion of the canal is obliterated, I should, in the first instance, endeavour to re-establish a passage by external division; and then, if any portion of the urethra could still be felt to be strictured, I would introduce the urethrotome, and freely divide by internal division such contracted portion."

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59. *Rupture of the Urethra.*—M. Notta submitted to the Surgical Society of Paris at a recent meeting the question: "What conduct should the surgeon pursue in cases of violent contusion of the perineum with rupture of the urethra without external wound, but complicated with retention of urine?" When we consult the classical authors we find ourselves greatly embarrassed, for while some of them advise supra-pubic puncture, others practise incisions in the perineum, and others, again, recommend antiphlogistics first being had recourse to. In presence of such divergencies, M. Notta relates three cases that have terminated successfully, and which he believes are of interest. In the first the patient had received violent kicks in the perineum, and at the end of thirty-six hours urinary infiltration had spread into the scrotum. Free egress was given to this by a large incision, and three days after a catheter was passed and left in (*sonde à demeure*). Fifty days after, the man was discharged cured. In the second case, contusion of the perineum was produced by the fall of an enormous stone, and four hours afterwards the perineum was found distended, and a catheter could not be passed. The urine was at once discharged by a button-hole operation in order to prevent infiltration, but the patient was lost sight of during three weeks, no catheter having been passed during that period. He was now menaced with retention by the cicatrization of the perineal wound, and a laborious dissection of indurated tissues became necessary to find the two ends of the ruptured urethra and pass a *sonde à demeure*. After several months of treatment, and the performance of internal urethrotomy, the patient was cured. In the third case, a mason fell astride a joist and exhibited the signs of rupture of the urethra, the distended bladder rising up to the umbilicus. A perineal incision gave issue to the urine, and a week after a *sonde à demeure* was introduced, and in five weeks after the accident the patient was cured, passing his urine freely by the urethra.

Thus, in these three cases, as soon as catheterism was found to be impossible, a large perineal incision was practised in the perineum. Supra-pubic puncture was not resorted to, for a great number of cases that have been published show that this has not prevented the formation of abscess in the perineum, which has compelled the surgeon to resort to the perineal incision, with which he had better have commenced. After from three to eight days the wound becomes sufficiently cleansed to allow of the *sonde à demeure* being passed for the purpose of re-establishing the integrity of the canal—the introduction of this being much facilitated by employing a long flexible whalebone bougie as a conductor. M. Notta always employs vulcanized caoutchouc catheters, which, being little acted upon by the urine, can remain a long time in the bladder without being changed. The incision into the perineum often requires to be very deep, in consequence of the great tumefaction that has taken place, and M. Notta has had to plunge his bistoury to a depth of ten centimetres.

M. Guyon observed that he had often met with these cases, and pursues a practice very like that recommended by M. Notta. It is dangerous to endeavour to penetrate into the bladder by the urethra, for the lacerations may

be increased and considerable hemorrhage produced. Sometimes, indeed, the bulb has been torn. We must, therefore, act through the perineum, and a true external urethrotomy has to be performed without a conductor. Immediately afterwards a bougie is passed in at the posterior end, and is then carried from behind forwards into the urethra, serving as a conductor for the *sonde à demeure*, the compression of which assists in arresting hemorrhage. Just as performing external urethrotomy without a conductor is a difficult procedure in a degenerated and fistulous perineum, so it is a simple operation after recent injury. M. Sée has recently met with two cases in children who fell astride bars of wood. In both there was effusion of blood and urine, and retention. In one case a catheter was introduced, and large incisions of the perineum were practised, and all bad symptoms at once disappeared. In the second case, in which the effusion was great, a catheter was also passed, but, slipping out, could not be replaced, and incisions were not practised until a few hours before death. M. Giraldès related the case of a boy who had crushed his perineum by a fall on a carriage-wheel. There being complete retention, the bladder was punctured above the pubes, and a litre of bloody urine having been evacuated, a *sonde à demeure* was passed through the same aperture into the urethra from behind forwards, and thence into the perineal wound which had accompanied the injury. The patient did well. M. Le Fort believes that a distinction should be made in these cases. Sometimes the contusion is accompanied by a considerable effusion of blood and urine, while at others there is but a slight effusion of blood, and yet the patient cannot pass urine. In the first of these cases, incision should at once be performed, for, if this be delayed, diffused phlegmon will be set up, for which it will have to be resorted to. In the slighter cases the bladder may be punctured, and, some days after, a catheter may be passed. M. Notta observed that in the slighter cases spoken of by M. Le Fort there is no rupture of the canal, the retention being then dependent on the compression caused by the effused blood. In such cases puncture may be used as a means for gaining time. M. Guyon observed that when there is very great tumefaction of the perineum, rupture of the urethra is present. In the other cases the catheter is passed with difficulty, but it can be made to enter.—*Medical Times and Gazette*, June 19, from *Gaz. Hebdom.*, June 4.

Incising the perineum, as advised by M. Notta, seems to be the true course in cases where the urethra is ruptured by external injury. This we supposed was well established many years since, and we will refer to some remarks on this subject by the editor, illustrated by numerous cases, in the number of this Journal for February, 1837, page 392 et seq.

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60. *Double Fistula in Ano; one treated by the Knife, the other by Elastic Ligature.*—Mr. MAUNDER communicated to the Clinical Society of London (May 28th, 1875) the following case: The patient, a female, æt. 24, had suffered from fistula *in ano* for some time; one fistula on the right side having made its appearance two years ago; another on the left side twelve months previously to her coming under observation. These two fistulæ were equidistant from the anus, and extended to about the same depth, where they communicated with the bowel. The one on the right side was divided by the knife, and the elastic ligature was applied to the one on the left. The knife-wound was dressed with a strip of oiled lint, and no application was made to the other. For two or three days after the operation, the patient complained of severe pain, and this was especially referred to the left side. On the sixth day, the ends of the ligature were found lying in a deep groove, which they appeared to have cut in the tissues; and, on the ninth day, the ligature came away. On the twelfth day, the wound made by the knife was almost on a level with the surrounding parts, while that which was the result of the ligature was a deep groove, having very prominent callous edges like the margins of a chronic ulcer of the leg. On the twenty-second day the knife-wound was completely cicatrized, but that made by the ligature was only partially healed, and still grooved. Five weeks after the operation it was found that the groove left by the ligature was converted into a sinus, the edges having united; it was, therefore, again united, and complete union took place in about a fortnight, *five*

*weeks* after the wound made by the knife had closed. Mr. Maunder remarked that, as a rule, it would be wrong to endeavour to establish a principle of practice from the experience of a single case, but the test of the efficiency of a method of treatment was absolutely trustworthy when two different operations were performed simultaneously upon the same patient, who was the subject of a similar complaint in corresponding localities. Under these circumstances, the history of the above case would induce him to declare in favour of the knife as a means of causing less pain and quicker restoration to health. The elastic ligature might be reserved for those who would on no terms submit to a cutting operation, as well as for those of hemorrhagic diathesis.—*British Med. Journal*, Aug. 21, 1875.

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## OPHTHALMOLGY.

61. *Affection of the Eye in Bright's Disease.*—Dr. Meighan demonstrated to the Glasgow Pathological and Clinical Society (April 13), with the ophthalmoscope, a case of disease of the retina in a woman aged 22, with albuminuria. She had first come under his notice at the Eye Infirmary in December last, complaining of dimness of vision of six weeks' duration. She could then read No. 19 with the right eye and No. 20 with the left (Jäger). The papillæ were then found congested, and not defined at their margins; the arteries were diminished in number and calibre, and some of them accompanied by white streaks; the veins were dilated and tortuous, and the vessels covered at parts by a whitish infiltration. In the neighbourhood of the macula lutea a large yellowish-white granular patch was seen, with shining spots interspersed; numerous white spots were seen elsewhere in the fundus, and also some hemorrhagic spots. The eyes were hypermetropic. The urine was found to be albuminous, specific gravity 1010; and the sediment contained granular casts. There was no dropsy, but there had been headache and vomiting. The heart was hypertrophied. She improved so that she could read No. 16 and No. 12; but on February 22d, intense headache, with slight delirium and vomiting, supervened, and next day she could not distinguish light from darkness. There was then circumorbital œdema, with œdema and congestion of the conjunctivæ, and dilated pupils. Ophthalmoscopic examination showed œdema of the retina, the refraction being thus rendered highly hypermetropic; and a large white mound encircled the disk, and at the circumference a few hemorrhagic spots were found. The urine had become diminished before this attack, and the breath seemed to have a urinous odour. The œdema of the retina subsided, the urine increased, and the vision improved, so that on April 8th she could read No. 6 with the right and No. 4 with the left. When she was shown to the Society, the œdema had disappeared, but the white spots had extended and coalesced, forming large patches: the hemorrhagic spots had become absorbed. The urine was still albuminous; measured during the previous week, it had averaged 36 ounces, and the specific gravity was rather low. There was no dropsy. The cardiac hypertrophy affected chiefly the left ventricle. Dr. Meighan regarded the case as of interest, in showing a well-marked lesion of the retina in Bright's disease apart from dropsy. There was fatty degeneration of the cellular tissue of the retina, as well as sclerosis of the nerve-fibres and bloodvessels. The sudden loss of vision, associated with something like uræmic poisoning and œdema of the retina, had come on with a diminished secretion of urine; and the sight improved as the urine became more abundant. —*British Med. Journal*, June 12, 1875.

62. *Miners' Nystagmus.*—Dr. Charles Bell Taylor describes (*Lancet*, June 12, 1875) under this name a peculiar malady of which the mines in the neighbourhood of Nottingham have, during the past twelve years, furnished him several examples. It is characterized by the peculiar oscillating motions of the eyeballs, and has been observed only in adults, and independent of other

ocular defects, among men employed in coal-pits. The oscillating movements are caused by alternating contractions of the recti or oblique muscles, and in all the cases observed by Dr. T. have been horizontal or rotatory.

"This affection," he says, "appears to be analogous to writers' cramp, pianists' and telegraphists' cramp, or the similar affection of the gastrocnemii occasionally observed in ballet-dancers. It may be developed in any or all of the muscles supplied by the third nerve, and is clearly caused by the over-taxing of these organs. The patient makes a great and sustained effort to see in an imperfect light; the muscles engaged in the accommodative strain are overburdened, in course of time give way, and at last, whenever called upon, just as in the analogous cases cited above, become, as it were, agitated and fluttered, escape from the control of the will, and perform irregular motions. It is clear, from these facts, that in all cases in which a considerable degree of exertion of the ocular muscles is required for distinct vision, nystagmus may, under certain concomitant favouring circumstances, be developed. Hitherto the cause of nystagmus has been referred to, and might usually be readily detected in, the eyeball itself; but these cases demonstrate that causes external to the organ, and independent of any structural or apparent functional changes, may occasion all the phenomena of that disease, or, more properly speaking, symptoms of disease. Nystagmus generally persists so long as its cause remains, and, if developed in childhood, may continue even after its removal; but in 'miners' nystagmus' the aphorism *sublata causa tollit effectus* applies, and, as a rule, change of occupation and working in a good light are all that is necessary to effect a cure," supplemented by such auxiliary treatment as may, in each case, appear to be specially indicated.

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63. *Method of Improving the Patient's Appearance in the last stage of Ophthalmia Tarsi.*—Dr. SOMERVILLE OLIVER, in a communication to the *Edinburgh Medical Journal* (June, 1875), remarks that "in the advanced stage of ophthalmia tarsi—the stage sometimes termed 'lippitudo'—when the eyelashes have disappeared, and the edges of the eyelids have become rounded, perhaps tumid and everted, after all has been done for the patient that can be done by the usual means adopted in such cases, the unseemly appearance caused by the loss of the eyelashes and the red margin of the lids is still very conspicuous; but it may, he thinks, be considerably lessened by *tattooing* the *margin* of the *eyelids* as darkly as possible with Indian ink.

"By using Snellen's eyelid forceps, there can be no risk of pricking the eye itself. Darkening the margin of the lids by tattooing would also mitigate the disfigurement caused by removal of the cilia and their bulbs in cases of trichiasis and distichiasis."

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## MIDWIFERY AND GYNÆCOLOGY.

64. *Fœtal Heart at an early period of Pregnancy.*—Dr. UNDERHILL related to the Obstetrical Society of Edinburgh (May 12, 1875) the following case:—

"On Sept. 6, 1874, I was asked by my brother, a medical student, to see a woman, Mrs. M'Gair, æt. 30, multipara, who was ill with fever, in the High Street. I found her a very spare and thin person, suffering from a moderately severe attack of typhus fever. She said she was several months pregnant—about three or four—but could not tell exactly. The abdominal wall was thin and lax, as she had had several children before. On palpation, I could not make out distinctly the shape of the enlarged uterus, but percussion revealed dulness extending for about two inches above the pubes. On placing the stethoscope on the dull part, and to the right of the middle line, I distinctly heard the double pulsation of the fœtal heart, and, taking out my watch, counted it; it was beating at the rate of between 160 and 170 pulsations per minute, while the mother's pulse, which I also counted, was only about 120. My brother afterwards listened and heard the heart beats and also counted the

number of pulsations, making them about the same as I did. I recommended the removal of the patient to the Royal Infirmary, where she was taken two days later, and was dismissed convalescent in a fortnight. She was delivered of a very large and healthy child on the night of 8th March, 1875—that is to say—six calendar months and two days, or 183 days, after I heard the fœtal heart, which was, taking 278 days as the average duration of pregnancy, only 96 days (13 weeks and 5 days) after the supposed successful coitus. It is right to add that the woman expected to be confined some time before the labour came off, and the very large size of the child makes it possible that pregnancy was protracted somewhat longer than usual, and that consequently an earlier date should be fixed for its commencement. But still the fact remains that the fœtal heart was heard in this case six calendar months before parturition, that is, about the beginning of the fourth calendar month of pregnancy.

"I have thought this case worthy of a short note, as being one of the earliest dates on record of hearing the fœtal heart, and because it shows that in a favourable case the diagnosis of pregnancy may be made certain in this way much earlier than is usually supposed. We were fortunate in this case in hitting upon the spot where the heart was nearest the surface at once, but in other cases in which I have examined for it in the middle months of pregnancy, I have generally found it to require considerable and sometimes prolonged search before it could be hit on, and the extreme mobility of the fœtus at this early period seldom allows of its being heard for many minutes consecutively in the same spot.

"The period at which the fœtal heart first becomes audible is very differently estimated by different authors.

"M. Depaul,[1] who investigated the subject with great care, stated that in 73 cases in which he examined for the fœtal heart-beat before the 20th week, 11 were in the third month, and in none of them was it audible; 22 were in the fourth month, and in two of them only, each of whom had reached three and a half months and dated from single coitus, was it perceptible; in the remainder, who were more than four calendar months pregnant, not to hear the fœtal heart was the exception. He further relates that, in endeavouring to show that the uterine souffle is audible at a very early period of pregnancy, he came upon two cases which proved to him that the heart can be heard at the end of the third month."

Dr. M. remarked that "the question of the earliest period at which these sounds become audible is of importance from two points of view: first, from the bearing it has upon practice in relation to the diagnosis of pregnancy in the earlier months; and, secondly, it is of physiological interest as showing at how early a period of its development a fœtus possesses a heart capable of producing sounds audible through the abdominal wall of the mother.

"Thus, in the fourth lunar month, *i. e.*, from the end of the 12th to the end of the 16th week (and you will remember that in the case before us the fœtus was supposed to be in the 14th week), the fœtus, according to Schroeder, is from 10 to 17 centimetres (4–6½ inches) in length, and weighs as much as 1860 grains, or about 3¾ ounces; and it is during this month that the external genitals first begin to assume the sexual distinction; similarly, Caspar says, that at the end of the fourth lunar month the embryo weighs 2½–3 ounces, and is from 5 to 6 inches long, the sex is just recognizable, etc. Now, it seems to me to be a point worthy of attention, if it can be proved that a being in other respects so small and imperfect, yet has a heart of such considerable power, for the size of the organ must be exceedingly small."—*Edinburgh Medical Journ.*, September, 1875.

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65. *On the Employment of Chloral as an Anæsthetic in Natural Labour.*—Dr. H. Chouppe, in the *Annales de Gynécologie*, May, 1875, has collected a large number of cases, recorded by various authors, exemplifying the use of chloral in labour; and from these, together with his own observations, he concludes that chloral, even in a dose capable of producing complete anæsthesia,

[1] Traité d'Auscultation Obstétricale. Paris, 1847. Pp. 243 *et seq.*

in no way suppresses, or even diminishes, the contractility of the unstriped muscular fibres in general, the uterus included. Chloral, which is capable of producing in a marked degree cutaneous anæsthesia, can equally nullify the pains of labour. This suppression of pain is not due to diminution of the uterine contractions either in their intensity or their frequency; on the contrary, all their power is preserved, and, if they seem occasionally to be retarded, that which they lose in frequency they gain in force; so much so, that labour is accelerated and not retarded. When uterine inertia is recognized as the cause of too prolonged labour, which has exhausted the powers of the patient, or when the patient is particularly irritable and fatigued by the useless efforts, and the uterine contractions diminish in frequency or intensity—when inertia is threatened, in fact—chloral administered in a dose sufficient to produce complete anæsthesia, is generally capable of restoring energy to the uterus, and force and regularity to the contractions.

Neither the infant nor the mother is injured by chloral anæsthesia. M. Pelissier, who has employed chloral largely, states that when administered prudently and in suitable doses, it is perfectly innocuous; indeed, the fœtus runs less risk of becoming asphyxiated. No evil after-effects retarding convalescence have ever been observed; on the contrary, patients seem to rally more rapidly from having been spared so much fatigue.

It remains to indicate more precisely in what cases chloral should be administered, at what stage of labour it ought to be given, in what dose, in what form, and by what channel.

Chloral will agree whenever it procures sleep, induces repose, and lessens the pains of parturition. It should especially be employed in tedious labours, and in primiparæ, because then the pains have an intensity which we only find exceptionally in subsequent confinements. It often happens that, the pains being very intense and the patient very nervous, force is wasted uselessly; and at the moment when they have, above all, need of all their force for the last expulsive efforts, the patients are fatigued, and the uterus ceases to contract. In these cases chloral, which procures repose and which prevents the patient from wasting her strength, is formally indicated.

Among nervous patients, who excite themselves and complain beyond measure, chloral will expedite delivery; and, even if during pregnancy we can promise to materially diminish the pains of labour, we shall lessen considerably the patient's apprehension.

Among hysterical patients, chloral acts beneficially.

The consideration of the employment of chloral in operative midwifery, and in eclampsia, as advocated by Dr. Playfair, is purposely omitted here, in accordance with the title of the paper.

When should chloral be given? In the immense majority of cases, when the dilatation of the os is complete—just as the expulsive pains commence. It is only in exceptional cases, and where patients suffer unusually, that chloral should be given during the period of dilatation.

The dose of chloral necessary will vary with the susceptibility of the patient, and with the effect one wishes to obtain. The dose generally varies from one drachm to one and a half drachm, given in two doses at half hour's interval, or in fifteen-grain doses every quarter of an hour, if we do not desire too rapid an effect.

The natural channel for its administration, and the one which should always have the preference, unless contraindicated, is by the stomach. The syrup of gooseberry is the best agent for masking the pungent flavour; and the solution should be made of such a strength that a teaspoonful represents fifteen grains. Should vomiting precede or follow its administration, it may be given by the rectum. As regards intravenous or hypodermic injections, they are too dangerous methods for ordinary natural labour.—*London Med. Record*, June 23, 1875.

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66. *The Placenta in a Triplet Birth.*—M. DEPAUL exhibited, at the Académie de Médecine, the placenta derived from a woman who had been delivered of triplets, the children at present (thirty days afterwards) being still alive. The

placenta forms a single mass of very considerable size, and the three distinct cords present examples of the three principal varieties of insertion. One of them is inserted into the centre of the placenta, another at its edge, and the third into the membranes, vascular communications existing between the cords. There are also three amniotic sacs.—*Med. Times and Gaz.*, July 17, from *L' Union Méd.*

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67. *Contribution to the Pathology of the Ovary.*—Dr. J. Foulis read a paper on this subject before the Obstetrical Society at Edinburgh, May 12th, 1875. The author gave a short statement of the views of Waldeyer on the development of the Graafian follicles and cells of the membrana granulosa, in which he laid stress on the fact that, whereas Waldeyer's investigations showed that both the cells of the membrana granulosa and eggs were derived from the germ epithelium on the surface of the ovary, his own investigations appeared to show that the eggs alone were derived from the germ epithelium, and the cells of the membrana granulosa were derived from connective tissue corpuscles of the stroma of the ovary. Having this fact as a basis for investigating the origin of cystic tumours of the ovary, Dr. Foulis stated that, as the result of numerous observations on the origin of cysts in the diseased ovary, he was able to demonstrate that, though many of the cysts of an ordinary cystic tumour of the ovary were simply over-distended Graafian follicles, in the walls separating these there was a growth of new cysts quite unconnected with presenting Graafian follicles, which might go on to an unlimited extent, and that the epithelium of these was produced from connective tissue corpuscles. He then drew attention to the very interesting fact that, in addition to the production of the epithelium of the cysts, the connective tissue corpuscle of the stroma, by general and excessive proliferation, might give rise to sarcomatous growths in the ovary; and that, through the escape of epithelial elements from the diseased stroma and cysts into the peritoneal cavity, secondary sarcomatous growths might arise on the peritoneum, which, by constant irritation, resulting in the pouring out of ascitic fluid, ultimately exhausted the patient. Dr. Foulis showed drawings of the little masses of sprouting cells which he had discovered in ascitic fluids surrounding ovarian tumours, and by the presence of which he had diagnosed malignant ovarian tumour and peritonitis in two cases whose histories had already been given to the Society; and he now gave short notes of three additional cases in which he had discovered the same little masses of sprouting cells in ascitic fluid, and in two of these cases a *post-mortem* examination verified the diagnosis made during life, viz., malignant ovarian tumour and peritonitis. The third case was that of a woman still alive, and in the ascitic fluid present an enormous quantity of the little masses of the sprouting cells were found. He then laid great stress upon the importance of a careful examination of ascitic fluids in cases where ascites complicated ovarian disease, and pointed out how rarely it was possible to get fluid by tapping from malignant tumours themselves, which were generally semi-solid. He ended by saying that it remained for future observation, to settle the question whether little masses of sprouting cells are ever found in ascitic fluids surrounding other malignant tumours of the omentum, peritoneum, etc., structures in which fibrous connective tissue exists in quantity.—*British Medical Journal*, Sept. 4, 1875, and *Ed. Medical Journal*, Sept. 1875.

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68. *Series of Fifty Cases of Ovariotomy.*—Mr. T. Keith has published (*British Med. Journal*, June 26th, 1875) his fourth series of fifty cases of ovariotomy. "There have been," he states, "fewer operations than in former years; but I have reason to believe, now that ovariotomy has become a comparatively common operation, that the more severe cases of the disease only come to me. During this period I have also been able to diagnose and cure by a single tapping, four cases of serous cyst of the broad ligament. These tumours would some time ago have probably been removed by operation."

Of these fifty operations six terminated fatally from septicæmia. In two of these the tumours were malignant.

"Further experience," says Mr. K., "has satisfied me of the value of the

actual cautery in the treatment of the pedicle, and I am coming to the conclusion that it is the best of all the intraperitoneal methods for securing the pedicle. At first I was prejudiced against this method, and only used it in the worst cases, where the clamp could not be employed. It has had from me a very severe trial, and, when the numbers are larger, I shall publish the whole of the cases in detail. This method, as is well known, was introduced by the late Mr. Baker Brown, and, after trying all sorts of improved clamps, I have gone back to the simple rough tool so successfully used by him.

"Sulphuric ether has been given in all the cases."

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

69. *Death induced by the excessive Smoking of Tobacco.*—Dr. B. W. RICHARDSON records (*Brit. and For. Med. Chirurg. Rev.*, July, 1875) the following example of this, which came under his own observation :—

"The patient, who was between thirty and forty years of age, was a small but well-built man, of very active habits, and reported to be exceedingly diligent and able in commercial pursuits. Previous to the occurrence about to be narrated he had been very much worried with business affairs, and had, no doubt, been trying to carry out labours which, if not beyond his own natural powers, at all events taxed them severely. He returned from business in the city of London one evening extremely fatigued, took a very slight meal, smoked several cigars and cigarettes—the precise number being unknown—and retired to bed. During the night he was heard moving about as if restless, and early the next morning he rose to work. He dictated some letters and other documents to his private secretary, and, declining all food, recommenced to smoke a cigar. He continued this process of smoking and dictating during the greater portion of the day, taking no food and, except a small quantity of brandy and water, no drink. In a period of less than twelve hours he had smoked forty cigarettes and fourteen full-sized, full-flavoured cigars. As the evening advanced he became prostrate, excited, and restless, refusing food and only sipping at drinks. Late at night he still refused to take either nourishment or medicine. He agreed, however, to give up smoking, and he went to bed and essayed for a few hours to sleep: he could not sleep, but continued excited and restless.

"Early on the following morning he came for the first time under the observation of the reporter. He was at this time half dressed and out of bed. He was in a state of continuous muscular tremor, and when he moved across the room to reach his bed his legs seemed bent or bowed as if he were permanently deformed, which, however, was not the fact. He had evidently lost the full use of the muscles of the lower extremities, and he climbed into bed with considerable difficulty. When he reclined in the bed a continued movement of the muscles of the arms and legs was kept up, and the facial muscles moved occasionally in an involuntary manner. The pupils were widely dilated and the eyelids were in persistent movement, half voluntary. The tongue was dry and dark red in colour. The surface of the body was cool (96° Fahr.), clammy, and perspiring. The speech was faltering and the mind uncertain. The pulse was soft, full, and feeble. Both sounds of the heart were clear, but the action was relaxed and occasionally intermittent. The respiratory sounds, at this period, were clear, but the respiratory movements were irregular and sighing. The breath and the cutaneous secretion were oppressively charged with the odour of tobacco.

"There being no direct antidote yet discovered for the poison of tobacco, the treatment was directed to sustaining the powers of the patient and to promoting the elimination of the poison. Of course all further resort to the cigars and cigarettes was forbidden, and fluid nourishment was ordered as freely as it could be given, together with small quantities of alcohol; it was directed that the temperature of the room should be sustained at 70° Fahr., with free venti-

lation; and in order to sustain the process of elimination full doses of the solution of acetate of ammonia were administered every four hours. It was also carefully observed that the urinary bladder was kept free of distension from urine, a practical point of great importance in the treatment of all forms of narcotic poisoning.

"The food and medicine prescribed for the patient were much objected to by him, his mind being entirely listless and every exertion seeming to be a source of annoyance. Still, he took and retained some food, and under its influence became warmer. But as the day advanced he gradually grew more and more unconscious, the muscular paralysis increased, extending from the lower limbs to the arms; every now and then there occurred a faint general convulsion, and the breathing became noisy and embarrassed. In the evening the patient was quite unconscious; his bronchial passages were filling with condensed watery fluid; he was unusually cold; there were constant jactitating movements of the muscles, and the collapse was complete. Death took place a short time after this change. A post-mortem examination could not be obtained, but the final mode of death was evidently by asphyxia from the accumulation of fluid in the pulmonary bronchial tract.

"We have not unfrequently observed in confirmed smokers a series of symptoms identical with those recorded above, except in the matter of severity and in immediate result. The symptoms tally, in the main, also with those we have seen induced in the lower animals by the action of nicotine, and they were, we believe, due entirely to the poisonous influence of that alkaloid. The action was distinctive; all the muscles that are under the involuntary nervous control were paralyzed; the semi-voluntary muscles were partly paralyzed; and the centres governing the volitional powers were so distended that their functions were perverted. Together with these changes there was a reduction of the animal temperature owing to an interference with the chemical changes of the body, and thereupon the final catastrophe succeeded of condensation of fluids in the pulmonary organs, a catastrophe common as a direct cause of death in those who are under the effects of other narcotic poisons than nicotine, as, for instance, chloral hydrate.

"The great question that remains to be solved is the treatment of cases such as the one described. In a case of poisoning by tobacco, in a boy who smoked and chewed tobacco for the first time, we found an emetic of signal service as an adjunct to treatment by the employment of external heat and the administration of a stimulant. But in the treatment of a confirmed smoker an emetic would only depress the more, the stomach being in fact paralyzed by the action of the poison. We have previously found the general plan that was adopted in the instance narrated—that, namely, of sustaining the external temperature of the body, promoting free elimination by the skin, keeping the urinary bladder properly relieved, and administering food with a judicious supply of alcohol—a perfectly successful method. On the present occasion all these measures proved unsuccessful, and would, we believe, be again unsuccessful in so extreme a case. It has occurred to us since that perhaps transfusion of blood might have saved the life, and in another emergency of a similar kind, we should propose to give it a trial."

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70. *Phosphorus Poisoning.*—Mr. Charles A. Cameron contributes to the *Dublin Journal of Medical Science* (August, 1875) an article on this subject, from which we extract the following: Some fatal cases of poisoning by phosphorus have lately occurred in Ireland; and on the Continent this substance is frequently the cause of death, either by design or accidentally. In manufactories where lucifer matches are manufactured, chronic poisoning by phosphorus is by no means rare. Necrosis of the teeth and of the bones of the jaws was very frequent amongst match-makers until the somewhat general substitution of red, or allotropic phosphorus for the common kind in the preparation of the matches. White phosphorus forms acid fumes on mere exposure to the atmosphere, whilst the red kind is unalterable in the air unless when highly heated. There is no good reason why the use of spontaneously inflammable phosphorus should not be wholly given up, as the other kind of this element is an effectual

substitute for the former. Indeed, the use of common phosphorus for this purpose might fairly be prohibited by the State.

In the works on Medical Jurisprudence it is laid down that there is no specific antidote for phosphorus poisoning. When just swallowed, the use of the stomach-pump and the administration of magnesia in the form of paste prove serviceable; but a few hours after the poison has been swallowed it has hitherto been found impossible to check the effects of this powerful substance. The precise manner in which phosphorus produces its toxic effects is not thoroughly understood. The quantity which often produces death is not more than 3 or 4 grains. In fatal cases the lesions revealed by *post-mortem* examination are frequently found to be very trifling—and, indeed, perfectly insignificant, when compared with those caused by arsenic, mercuric chloride, the stronger acids, and all other corrosive poisons. Phosphorus probably produces its worst effects by withdrawing oxygen from the blood.

On the 25th April, 1874, M. Depaire, on the part of the Revision of the Pharmacopœia Committee, presented[1] a report on the employment of essence of turpentine as an antidote for poisoning by phosphorus. The report detailed the results of numerous experiments performed on dogs, the results of which proved that essence of turpentine did not possess, as alleged by recent experimenters, the properties of an antidote to phosphorus. The animals experimented on were dogs; the phosphorus was dissolved in olive oil, and administered by the mouth and by hypodermic injections. The turpentine was given as a gummy emulsion, and was administered by the mouth. The experiments of Curviè Vigier, and more especially of Rommelaere, have, however, shown that essence of turpentine, when not rectified, has the property of neutralizing the toxic effects of phosphorus. In a communication[2] by M. Rommelaere, read before the Belgian Academy of Medicine, on the 26th December, 1874, the author has shown that rectified essence of turpentine did not act as an antidote in the case of dogs poisoned by phosphorus, but that the common turpentine did. The common turpentine has, especially under the influence of light, the property of readily absorbing the oxygen of the atmosphere, and of parting with it to other oxidizable bodies, and probably of converting part of the absorbed oxygen into ozone. It would appear, then, that essence of turpentine only acts as an antidote to phosphorus by reason of the oxygen which it contains, and which converts the phosphorus into an oxidized and comparatively innocuous body. If this be really the case, the poisonous action of phosphorus must, as surmised, be due to its withdrawal of oxygen from the capillaries. Several experiments have shown that phosphorus dissolved in oil brought into contact with common turpentine, forms a solid compound. If it be really the oxygen or ozone contained in turpentine that acts as an antidote to phosphorus, it might be desirable to ascertain whether peroxide of hydrogen, which parts readily with its oxygen, might not be an antidote for phosphorus. A solution of this substance might be hypodermically injected or given by the mouth. In cases of phosphorus poisoning in man, M. Rommelaere recommends the administration of 1 gramme (15.4 grains) of turpentine every half hour or hour during the progress of the case, fats and oils of every kind, mucilaginous substances, and alcohol.

It has been recommended to suspend small vessels containing turpentine in the rooms where matches are prepared, in order that the vapours of phosphorus might be neutralized by those of the turpentine. We believe that this suggestion has been acted upon in two or three English and Belgian manufactories.

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[1] Bulletin de l'Académie Royale de Médecine de Belgique, tome 8, No. 13.
[2] Ibid., tome 8, No. 13.

# AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*Hydrophobia from the Bite of a Skunk.* By J. A. Wolf, M.D., Acting Assistant-Surgeon, U. S. A.

I was called April 30, 1875, at four P. M. to visit D. F., aged twelve years, who, it was stated, was suffering with fever. The messenger also informed me that the boy had not been well since the morning of the 29th, and that he had been bitten by a skunk several weeks previously. I prescribed bromide of potassium ℥j, one-half to be given at once, the remaining half an hour thereafter.

On my arrival, at 6 P. M., I was informed by the parents that on the night of the 6th of April, while sleeping on the ground in a picket building, he was bitten by a skunk through the tip of the nose and end of the left thumb. The wounds were small and healed in a few days, causing no inconvenience nor any alarm to the parents at the time. The animal was secured and killed immediately after the occurrence of the accident. It had obtained ingress to the room through an opening between the pickets within a few feet of his head.

On the morning of the 29th of April the boy complained of not feeling well; he was indisposed to move about or make any exertion. He nevertheless undertook to do some work for a neighbour, but was compelled to give it up, and spent the remaining portion of the day in bed. He was observed to be quite restless; complained of feeling feverish, with slight pain in his left arm, running from the wound in the thumb to the shoulder. He also complained of pain in the umbilical region, for which his father administered a dose of cathartic pills.

I found the patient in bed, where he had been since noon of the 29th. He was very much agitated, his face flushed, eyes glaring with terror, pupils dilated to their utmost, slight spasm of the muscles of the neck, head thrown slightly backward. He complained of thirst, was greatly agitated on giving him medicine, making a sudden dart for the spoon, with a hurried effort to swallow, which brought on increased spasm of the muscles of the larnyx with disturbance of respiration, lasting about a minute, then again becoming comparatively calm. On these occasions froth would make its appearance at the mouth, and he frequently spat violently; respiration and pulse slightly accelerated; skin warm and dry; intellect clear. The bromide of potassium having seemed to exercise a calmative influence, I ordered potassii bromid. grs. xxx, morph. sulph. gr. ½ in camphor water every two hours, and cauterized the wound of the thumb, which was covered with a dry scale.

At 3½ A. M., May 1, I found my patient exceedingly agitated and restless, tossing in bed from side to side and throwing his arms about in every direction; frequently grasping his chest with one hand; his countenance expressing intense anguish; respiration very much accelerated and laborious, with constant gasping for breath. His thirst was intense, said

he had had no water for seven days, wanted a bucketful, but when it was offered he refused it in consequence of the intensification of the spasm of the respiratory muscles. The medicine ordered at last visit had been given as directed, without any good effect. I noticed, however, the pupils were not so widely dilated. I immediately injected $\frac{1}{3\frac{1}{2}}$ gr. sulphate of atropia into the right arm and again cauterized the wound in the thumb. To avoid inducing the horrible spasms, I administered water by injections per anum. At four A. M. repeated hypodermic injection of $\frac{1}{3\frac{1}{2}}$ gr. sulphate of atropia. At four and a half A. M. gave by mouth chloral hydrate grs. xxx. At five A. M. again injected $\frac{1}{3\frac{1}{2}}$ gr. sulphate of atropia into arm.

From the time of this visit the symptoms became more grave; respiration more frequent and difficult; the pulse went up to 130, and became gradually weaker. The administration of the dose of chloral caused violent retching and spitting of froth from the mouth, but there was no vomiting.

The patient died at six A. M. May 1st, suddenly and very quietly. There was no impairment of the intellect. It was remarked by those present that the boy was unusually bright, speaking rapidly, and expressing himself intelligently.

The period of latency of the disease was twenty-two days, and the patient died in about forty-eight hours from the first observance of his indisposition. No *post-mortem* examination could be made.

FORT MCKAVETT, TEXAS, June 4, 1875.

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*Ligation of Femoral and Profunda Arteries.* By THOMAS B. WILKERSON, M.D., of Young's X Roads, Granville, N. C.

A private of a Virginia regiment, Confederate Army, was wounded at the battle of Winchester September 19, 1864, by a Minié ball, which passed through the right thigh, about two and a half inches below Poupart's ligament, ranging obliquely through superficially; wounding likewise the scrotum at its junction with penis, and entering the left thigh about one and a half inches below Poupart's ligament, making its exit on the opposite, a little above the point of entrance. The man was under the charge of Surgeon Duval, of Kentucky, and did well until the 19th day of October, one month after he was wounded, when Dr. Duval and I were hurriedly summoned, and found this man bleeding freely from the inner wound of the left thigh, jetting a large stream of arterial blood. The cheeks were blanched, and he had fainted. I requested Dr. Duval to compress the femoral artery, and, without the use of chloroform, made an incision three and a half inches in length, commencing a little below Poupart's ligament, in the line of the femoral artery, dividing the skin, superficial and deep fascia, turned out the clotted blood, and found the sheath of the femoral vessels looking normal, but searching along the inner and upper portion of the femoral, breaking up some adhesions, the profunda femoris was discovered divided near its origin. A fibrous clot had been displaced from the distal and proximal ends. I passed a ligature around the femoral, both above and below the origin of the profunda, and tied the distal end of the profunda, closed the wound, and wrapped the limb in flannel, placing warm sand-bags and bottles of warm water along the sides of the limb. Gave him an enema of whiskey, morphia, and sulphate of quinia. After forty-eight hours a perceptible warmth could be felt in the limb, and after four or five days a feeble circulation could be discerned in the posterior tibial at the ankle. The ligature separated on the twentieth day. No

bleeding. Under a generous diet and tonics he continued to improve and recovered.

My impression is that the profunda femoris was divided by the ball in the first instance, and a clot had fortunately closed the divided ends of the vessel, and was unfortunately displaced. But it probably remained long enough to allow a partial collateral circulation to be established, and that contributed a great deal to the fortunate result of the operation.

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*A Case of Traumatic Tetanus treated by Chloral Hydrate and the Bromide of Potassium; Recovery.* By GEORGE N. MONETTE, M.D., Physician to St Anna's Asylum, New Orleans, Louisiana.

On March 10th, 1875, I vaccinated Lizzie D., aged two years, on the left leg, three inches below the knee. The successive stages of a successful vaccination progressed favourably until the crust fell on Sunday, April 4th. Ignorant friends had grave forebodings on account of the granulated phase of the cicatrix, and suggested the application of a poultice of bread and milk. This was perseveringly applied until Wednesday, when I was sent for. I found that the child had traumatic tetanus, and apprised the mother of the origin of the convulsions. I began the immediate use, internally, of chloral hydrate and bromide of potassium in 10 grain doses, every three hours, until their administration caused her to fret, reproducing the spasms. Any effort, either at laughing or crying, would excite muscular spasm. I substituted rectal enemata of same medicines in *fifteen* grain doses every three hours, *pro re nata*, sometimes combined with paregoric in ʒj doses. Through the inexpertness of the nurses, some of each enemata was ejected, hence a protracted suffering. The spasms were typical; opisthotonos decided, and trismus complete. The spasms continued for eighteen days, with more or less abatement of their violence, which was due to the impression which the family had in regard to the inability of any remedial intervention. I sustained the patient *per rectum*, giving beef-tea and starch enemata. I also directed beef-tea and rice-water, also milk to be given by mouth, whenever she would or could swallow. However, the act of deglutition seemed to provoke a spasm. I used bottles of hot water, wrapped with flannel wrung from hot water, placed along the spine and extremities, with happy effect. Moderately violent spasms continued until as late as the twenty-third day, when they appeared to yield to the specific influence of the remedies used. During the length of her attack she took 1800 grains of chloral and the same amount of bromide of potassium. She has almost entirely recovered from the violence of the attack (May 28th). She has an unsteady and somewhat tottering gait. I anticipate a restitution of muscular tonicity and development by repeated friction. I have no fears as to her ultimate and complete recovery. This is the only case that I ever saw get well *or cured* of tetanus. I may be in error in ascribing her recovery to the remedies, as the spasms may have been discontinued coincidently with the cicatrization of the vaccination pustule.

No. 285 MAGAZINE STREET.

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*Case of Retro-Uterine Hematocele, discharging through the Rectum, and terminating in Recovery.* By J. M. GREENE, M.D., of Aberdeen, Miss.

On the 29th of January, 1875, I visited Mrs. T., aged 32; married, having two children. Menstruation, which occurred at the age of 14,

had always been regular and normal, until the epoch of the 15th of November last. The flow then became excessive, was attended with lumbar and sacral pains, failed to cease after four days, as was her custom, and had continued, in varying quantity, to the time of my visit. Lumbar and sacral pain had likewise continued, but there had been no constitutional symptoms except anæmia and debility, with occasional "feverishness." Patient had not been confined to bed, but had from time to time attended to household duties.

On examination *per vaginam*, the uterus was found *in situ*, a little enlarged, movable, with a patulous os admitting the end of the finger. Behind its body, *above the roof of the vagina*, was a small hard tumour which the finger failed to isolate from it. There was some supra-pubic tenderness, but no hardness or enlargement.

The diagnosis lay between a small hematocele and a possible fibroid tumour in the posterior uterine wall. But as the taxis had considerably increased the flow, it was deemed inadvisable to use the sound as a diacritic measure. Ergot and opiates were prescribed, and rest strictly enjoined.

The flow soon ceased, pain abated, and the patient did well until the night of February 13th, when, the regular menstrual epoch pending, the flow returned with increased profusion, lumbar and sacral pains were renewed with violence, and there was evident shock. Vaginal taxis now revealed a large elastic tumour filling the cul de sac, pushing forward the posterior wall of the vagina, and forcing the uterus against the pubis. Externally it could be felt to extend nearly to the umbilicus. The case was now clearly one of retro-uterine hematocele.

Reaction and peritonitis ensued. From the 16th to the 18th there were frequent mucous discharges per anum. Pelvic distress was severe, but the bladder was evacuated naturally.

On the 21st Dr. E. P. Sale of this place saw the case with me, and concurred in the propriety of entrusting the accumulation to absorption or spontaneous evacuation. The latter took place on the 23d, the patient discharging through the rectum a large mass of blood with pus, which was followed by immediate relief. Recovery was rapid. Normal menstruation recurred on the 17th of March, and again in April and May, and the party is now, June 24th, in good health.

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*On the Use of Warm Water and Carbolated Balsamic Compound in Surgical Injuries.* By A. C. MACKENZIE, M.D., Surgeon to Iron Cliffs Iron Ore Mining and Smelting Co., Negaunee, Lake Superior, Michigan.

Having obtained the most satisfactory results from the use of the subjoined recipe as a surgical dressing, I submit it to the judgment of my professional brethren, trusting it may be found as useful in their practice as it has proven in my own.

Our practice in this somewhat isolated part of the world is to a great extent of a surgical character, and owing to the greater portion of our inhabitants living in ill-ventilated quarters, accompanied by poor hygienic surroundings, the sequelæ of injuries are very apt to assume an erysipelatous form, this latter being greatly augmented by the miners working below the surface aided by artificial light and breathing in a vitiated atmosphere.

The warm water application I do not claim as original, but cheerfully credit it to Prof. Frank H. Hamilton, of New York. I do not wish to

discard cold *in toto*, but will simply say that in my experience, a part of which has been passed under the tropics as well as in this extreme northwest, I have never in a single instance had to contend with disastrous sequelæ attendant upon surgical injuries where the balsamic compound had been used liberally and warm water applications strictly adhered to. I am confident, from experience, that the use of cold as a topical application to surgical injuries, where the tissues are broken, is the most pernicious practice in cold climates, and nearly so, if not quite, contraindicated in *any* latitude north of the Mississippi. The warm water not only hastens the exit of disintegrated material, but conveys to the sufferer that soothing effect which heat alone communicates. The formula which I am accustomed to use in my practice is the following: R. Balsam fir, true Venice turpentine, oil of sweet almonds, āā ℥ij; add carbolic acid ℥ss previously dissolved in ℥ij warm glycerine.—M.

Sig.—Apply with a flat camel's hair brush, and inject into the interstices of the wound with glass syringe, having previously cleansed the wound with very warm water and bulb syringe. Warm water applied *ad libitum*, and the diseased or injured portion enveloped in flannel cloths immersed in water as hot as can be borne comfortably.

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## DOMESTIC SUMMARY.

*Turning in Pelves Narrowed in the Conjugate Diameter.*—The *American Journal of Obstetrics* for August, 1875, contains a learned paper on this subject by Dr. Wm. Goodell, concluding with the following propositions:—

"1. Turning should generally be preferred to the lashing of the forceps handles.

"2. In pelves uniformly contracted the forceps is the better means of delivery.

"3. In pelves narrowed in the conjugate diameter, turning should be resorted to whenever a half-hour's faithful trial with the forceps fails to make the head engage.

"4. In pelves whose conjugates range from 2.75 to 3.25 inches, turning should be the initial step."

*Pregnancy and Labour in Epileptic Women.*—Dr. John S. Parry, in an instructive paper in the journal just quoted, states that "In regard to the relations existing between pregnancy, parturition, and epilepsy, experience and the study of the literature of the subject appear to warrant us in making the following statements:—

"1. Epileptics rarely have convulsions during labour. They are not more liable to puerperal convulsions than healthy women. Labour in them is, as a rule, not more unfavourable than in healthy women.

"2. In the exceptional cases, in which violent epileptic convulsions occur during labour, it is not decided whether it is best to hasten delivery or to trust to nature.

"3. Pregnancy may be the immediate cause of epilepsy. In these cases fits rarely occur during labour, and the disease is immediately arrested by parturition, but it will almost always reappear whenever the woman becomes pregnant.

"4. Either form of epilepsy may result in the death of the fœtus, but convulsions of this kind are not as likely to destroy the child as are those which may be correctly designated puerperal."

*Traumatic Aneurism of the Left Subclavian Artery successfully treated by Compression.*—A very interesting case of this is recorded (*New Orleans Med. Journal*, July, 1875) by Dr. Warren Stone. The subject of it was a man,

æt. 25, who was wounded 22d April, 1874, by a pistol ball, which entered immediately above the left clavicle, about ½ to ¾ of an inch from the sterno-clavicular articulation, and passed downwards and backwards, lodging under the skin just at the margin of the posterior border of the scapula, at a point corresponding to the origin of its spine.

Between two and three weeks afterwards an aneurismal tumour was revealed, which, when seen by Dr. S., about a month after the wound had been received, was of the size of a guinea's egg, and about the same shape. Dr. S. determined to try compression, and having secured skilful assistance, this was commenced June 15th, 1874, after the injury. The compression was continued, as Dr. S. states, "without interruption for 39 hours, when we were forced to desist, as the soft parts beneath had begun to slough, and the patient was so exhausted from pain and fatigue as to be unable to bear more. After carefully placing him in bed, it was found that the tumour had diminished to nearly one-half its original size, and that, although distinct pulsation was felt, it was markedly feebler, and the density of the sac greatly increased. Perfect quietude was enjoined, and the result awaited with feverish impatience. . . . A strict surveillance was kept over the patient, and it was observed that the swelling and pulsation slowly diminished from month to month, proportionately increasing in density. About the middle of last March all pulsation had ceased, and has not returned up to date.

"The tumour is as hard as a marble and quite small.

"The pulsation at the left wrist can be felt, but is very feeble; he is in good health, suffers no inconvenience whatever, and is gradually recovering the use of the left arm, which, until recently, he has been forbidden to use but to a very limited extent, for fear of disturbing the aneurism."

Dr. Stone alludes to the well-known case of Dr. Smythe, in which the innominate, common carotid, and vertebral arteries were successively tied for traumatic aneurism of the right subclavian, and states that the patient, after living ten years, died a short time since of hemorrhage from the original sac, which had become filled by the collateral circulation.

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*A New Antipruritic Remedy.*—Dr. L. DUNCAN BUCKLEY having noticed in a medical journal (see No. of *Med. News and Library* for April, 1874, p. 57) that equal parts of chloral and gum camphor, when rubbed well together, are converted into a fluid substance, it occurred to him that this would be of value in allaying itching, inasmuch as camphor oftentimes affords relief when locally applied for this purpose; and he has employed chloral internally to the same end. He therefore had an ointment prepared after the following formula: R.—Pulv. gummi camph., chloral hydrat., āā ʒj; ung. aquæ rosæ, ʒj. M. Rub the chloral and camphor carefully together till a fluid results; then add slowly the ointment. "This, when applied," he says, "to the healthy skin, produces no effect, but possesses great power in arresting itching without overstimulating the parts. It does not answer when the skin is at all broken; it is then necessary to employ other less irritating agents, but the burning sensation caused on its first application lasts but a few moments, when the relief occasioned I have known to last for hours, or even a whole day.

"This compound is soluble also in almond oil, alcohol, and ether to a considerable strength, as also in collodion. I have never employed it other than in the formula above given, except that I have ordered it of a less strength, half a drachm of each to the ounce, also increased to a drachm and a half of each to the same quantity. I should expect a solution of moderate strength in collodion would prove useful in localized itching.

"In using this remedy the only caution I know of is to see that the parts to which it is to be applied are not greatly if at all excoriated by scratching, as the application is then pretty painful, and the unprotected derma is irritated, and possibly inflamed thereby."

From its success in three forms of itching, namely, that of pregnancy, that of the vulva, and that due to a pure neurosis, Dr. Buckley suggests the employment of the camphor and chloral compound in the general pruritus attending the senile alterations in the skin, also in anomalous cases and in those of chronic

papular eczema or lichen, where itching is a prominent feature, likewise in the pruritus hiemialis lately described by Dr. Duhring, of Philadelphia.

The ointment loses strength on standing exposed, and should be made fresh very frequently.—*Trans. Am. Med. Assoc.*, 1874.

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*Improved Method of Obtaining Support for Fractured Bones of the Extremities.*—Dr. J. Wackerhagen states (*New York Medical Journal*, September, 1875) that during the past ten months he has practically tested nearly all the materials that have been employed for dressing fractures, and found all of them more or less defective excepting plaster of Paris, and for the application of this he proposes the following method:—

"After replacing the fragments as accurately as possible (extension being maintained by assistants), the limb is smoothly bandaged with cotton-wadding, prepared in the form of an ordinary roller; a flannel bandage spread with dry plaster of Paris, and rolled, is now soaked in warm water (to which I generally add about two fluidounces of saturated solution of sulphate of potassium), and applied to the limb, over the wadding, by circular and reversed turns. One layer of the flannel applied in this way is amply sufficient for support.

"When we wish to inspect the point of fracture, the dressing, which is only about an eighth of an inch thick, is easily cut through by a pair of curved scissors.

"If it is desired to employ lateral splints, the dressing should be cut in the median line of the anterior and posterior surfaces. If antero-posterior support is preferred, it should be cut through the lateral surfaces. The splints should now be varnished on their inner and outer surfaces with shellac, or this preparation may be applied to the outer surface before removal.

"The shellac seems to permeate the dressing sufficiently to increase the strength of the splint, and at the same time renders it slightly flexible instead of brittle, as is the case when plaster of Paris is used alone."

—

*Bifurcated Foot with Eleven Toes.*—Dr. Geo. J. Bull, of Worcester, records (*Boston Med. and Surg. Journ.*, September 9) a case of this extremely rare, probably unique, malformation in the human subject. The subject of it was a girl, "healthy and apparently well formed, except in the left inferior extremity. Her left foot presents the heretofore unheard-of number of eleven toes, and in its general appearance may be compared to a double or cloven foot. It has only one heel, but in front consists of two parts, which we may call the anterior and posterior feet. The anterior presents the great toe with four smaller toes, naturally placed and of normal proportions, but is twisted downwards and inwards in the position of extreme talipes equino-varus. Several pits or depressions over the tarsus mark the position of interspaces between the bones, and show the extent of the inversion, which is further shown by the fact of the inner border of the foot pressing against the heel. Continuous with the outer edge of the anterior foot, and curving beneath it, is the posterior part, looking not unlike a second foot, and furnished with six well-formed, small toes, situated directly below the other five. The plantar surfaces of the two sets of digits face each other, and are separated by a groove, which, beginning between the little toe of the anterior foot and the adjoining one of the supernumerary set, grows broader and deeper as it proceeds inwards, and, winding around the metatarsal bone of the great toe, is lost in the furrow between the heel and the inner border of the anterior foot. The two feet are thus quite distinct at the phalanges, and their plantar surfaces are more or less free, that of the anterior foot being visible as far back as the first metatarsal bone, while that of the posterior foot is almost all to be seen, and terminates so naturally on the heel that it is difficult to say to which foot the heel more properly belongs. The eleven toes are perfect in form; none of them are webbed. The great toe and four smaller toes of the anterior foot are normally proportioned; the little toe is the exact image of the first toe of the supernumerary set which adjoins it; the second is the longest of the six, but does not at all resemble a great toe; the third and fourth are equal in length, the fifth and sixth are shorter, as are the outermost toes in the normal foot. The six extra toes remain almost without motion when the normal toes are flexed and extended, but they appear to

have distinct metatarsal bones, and perhaps two or more bones of their own in the tarsus. Passing upwards we find the left leg and thigh much thicker than the right, but in length the two sides are equal. The difference in size may be seen in the following measurements:—

| | Right side. | Left (abnormal). |
|---|---|---|
| The circumference of the upper part of the thigh measures | 7½ inches. | 9¼ inches. |
| " " " thigh just above the knee " | 6½ " | 7½ " |
| " " " knee " | 5½ " | 6½ " |
| " " " leg immediately below knee " | 5¼ " | 5½ " |

"There does not appear to be any unusual development of bone, but there is evident muscular hypertrophy. When the knee is partly flexed a rigid cord or tendon may be felt in the position of the outer hamstring, passing back of the knee, where it stands out prominently beneath the skin, and is continued downwards behind the fibula almost as low as the os calcis. The left labium majus has been twice as large as the right ever since birth. During the mother's pregnancy nothing remarkable happened, nor has anything been discovered to account for this strange malformation."

Dr. Bull calls attention to the occurrence of this deformity on the *left* side, and states that he has observed a remarkable tendency in polydactalism to affect the left side more than the right.

—

*Localization of the Functions of the Brain.*—The *Boston Med and Surg. Journ.* (July 29, 1875) contains an interesting lecture on this subject by Dr. C. E. BROWN-SÉQUARD. The general principle that parts exist in this organ which serve for definite functions is now pretty generally admitted, and the question remaining to be discussed is therefore whether or not such parts have as yet been found. The lecturer has been "led to believe that lesions of the brain produce symptoms not by destroying the function of the part where they exist, but by exerting over distant parts either an inhibitory or an exciting influence, or, in other words, either by stopping an activity or by setting it in play. This implies the existence of localized functions, but it does not in the least imply that the localization is such as is supposed to exist by Hitzig, Meynert, and others. If we suppose that each of these functional centres is located, not, as these physiologists admit, in a cluster of cells all collected into a certain space or a limited and well-defined part of the brain, but in cells very widely diffused through that organ, we can easily explain all the facts that are furnished by experimentation on animals and by clinical observation. With this theory we can easily understand why considerable lesions in the two sides of the brain may not be followed by the loss of any function, while it is impossible to reconcile such a fact with the former theories of localization."

In conclusion, Dr. Brown-Séquard says, "that if we survey all the facts brought forward to support the supposition that there are distinct psychomotor centres in the brain, belonging to each set of muscles performing a distinct kind of movement, we find that it is impossible to admit that these centres occupy a separate, well-defined, and limited territory in some of the convolutions of the anterior and middle lobes of that organ; and we find also that the supposition brought forward in the beginning of this lecture, that the nerve-cells endowed with each of the primary functions of the brain are disseminated through that organ, so that no local lesion or irritation can reach more than a part of those endowed with the same function or the same kind of activity—we find, I repeat, that this supposition is supported by most of the known facts, and out of harmony with none."

## WARREN TRIENNIAL PRIZE.

**The Trustees of the Massachusetts General Hospital give notice that the next Warren Prize, amounting to somewhat less than $400, will be awarded to the author of the best essay, considered worthy of a prize, on any subject in Physiology, Surgery, or Pathological Anatomy, embodying original researches.**

**Each essay should be accompanied with a sealed envelope containing the author's name and address, and be sent to the undersigned on or before February 1, 1877.**

**NORTON FOLSOM, *Resident Physician.***

**BOSTON, Sept. 1, 1874. Massachusetts General Hospital.**

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Ernest S. Lewis, M.D., Professor of Materia Medica and Therapeutics.

Edmond Souchon, M.D., Albert B. Miles, Demonstrators of Anatomy.

The next annual course of instruction in this Department (now in the forty-second year of its existence) will commence on Monday, the 15th day of November, 1875, and terminate on Saturday the 18th day of March, 1876. Preliminary Lectures on Clinical Medicine and Surgery will be delivered in the amphitheatre of the Charity Hospital, beginning on the 20th of October, without any charge to students.

The means of teaching now at the command of the Faculty are unsurpassed in the United States. Special attention is called to the opportunities presented for

## CLINICAL INSTRUCTION.

The act establishing the University of Louisiana gives the Professors of the Medical Department the use of the great Charity Hospital as a school of practical instruction.

The Charity Hospital contains nearly 700 beds, and received, during the last year, nearly six thousand patients. Its advantages for professional study are unsurpassed by any similar institution in this country. The Medical, Surgical, and Obstetrical Wards are visited by the respective professors in charge daily, from eight to ten o'clock A. M., at which time all the students are expected to attend and familiarize themselves, *at the bedside of the patients*, with the diagnosis and treatment of all forms of injury and disease.

The regular lectures at the hospital, on Clinical Medicine by Professors Bemiss and Joseph Jones, Surgery by Professors Richardson and Logan, Diseases of Women and Children by Professor Hawthorn, and Special Pathological Anatomy by Professor Chaillé, will be delivered in the amphitheatre on Monday, Wednesday, Thursday, and Saturday, from 10 to 12 o'clock A. M.

The administrators of the hospital elect annually *twelve resident students*, who are nominated by the institution.

### TERMS.

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| For the Tickets of all the Professors . . . . . | $140 00 |
| For the Ticket of Practical Anatomy . . . . . | 10 00 |
| Matriculation Fee . . . . . | 5 00 |
| Graduation Fee . . . . . | 30 00 |

Graduates of other recognized schools may attend all the lectures upon payment of the matriculation fee; but they will not be admitted as candidates for the Diploma of the University except upon the terms required of second course students. All fees are payable in advance.

For further information, address T. G. RICHARDSON, M.D., *Dean*.